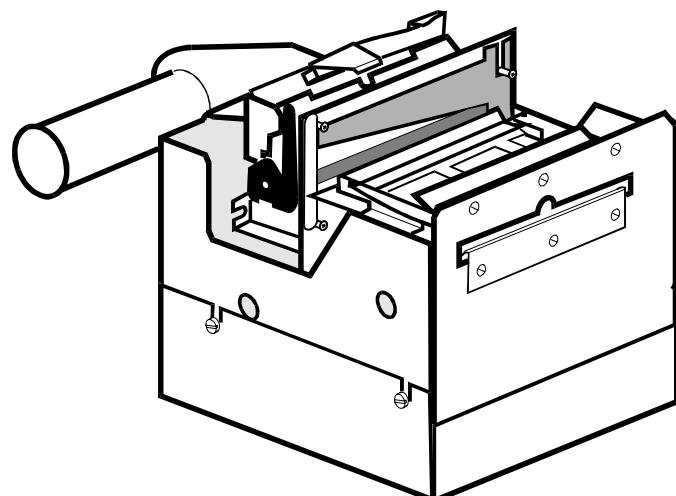


TTP 5200/5250 Kiosk Printer Sub-system

Service Manual



SW95005A-R2

Related manuals

TTP 5200/5250 Getting Started (01451-000)
TTP 5100/5200/5250 Operating Instructions (01434-000)
TTP 5200/5250 Installation Manual (01436-000)
TTP 5200/5250 Technical Specification (01441-000)
TTP 5200/5250 Service Manual (101469)

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1.1

About this manual

This manual describes the Swecoin TTP 52x0 Series kiosk printers, their function, maintenance instructions, spare parts, etc. For information about the TTP 5000 and TTP 5100, please use the "TTP 5000 Series Service Manual" 00803-000.

1.2

Updating

This manual will be updated as, from time to time, printer functions and features may be added or amended. You will always find the latest edition on our web site (www.swecoin.se). You can order printed copies of the current manual by e-mail, fax, or phone.

If you require functions not found in the manual edition at your disposal, you are welcome to consult one of our representatives for information.

1.3

Safety precautions

Handling the printer in a safe way requires that you keep your fingers away from the cutting mechanism when the power is switched ON.

1.4

The TTP 52x0 products

Two basic models are available: TTP 5200 and TTP 5250. The 5200 requires dual supply voltage; 5V and 24V, while the 5250 only requires 24V. Apart from this the models are exactly the same.

Each model is further divided into **types** representing the paper widths 60, 80, and 112 mm. Each type can also be divided into **versions** depending on installed options.

A unique, Swecoin patented, feature of the TTP-series of printers is that they can retain the document inside until both the printing and the cut-off operations are completed.

A number of sensors monitor the printer operation.

Refer to the applicable Technical Specification and Installation Manual for further information on technical data, printer functions, etc.

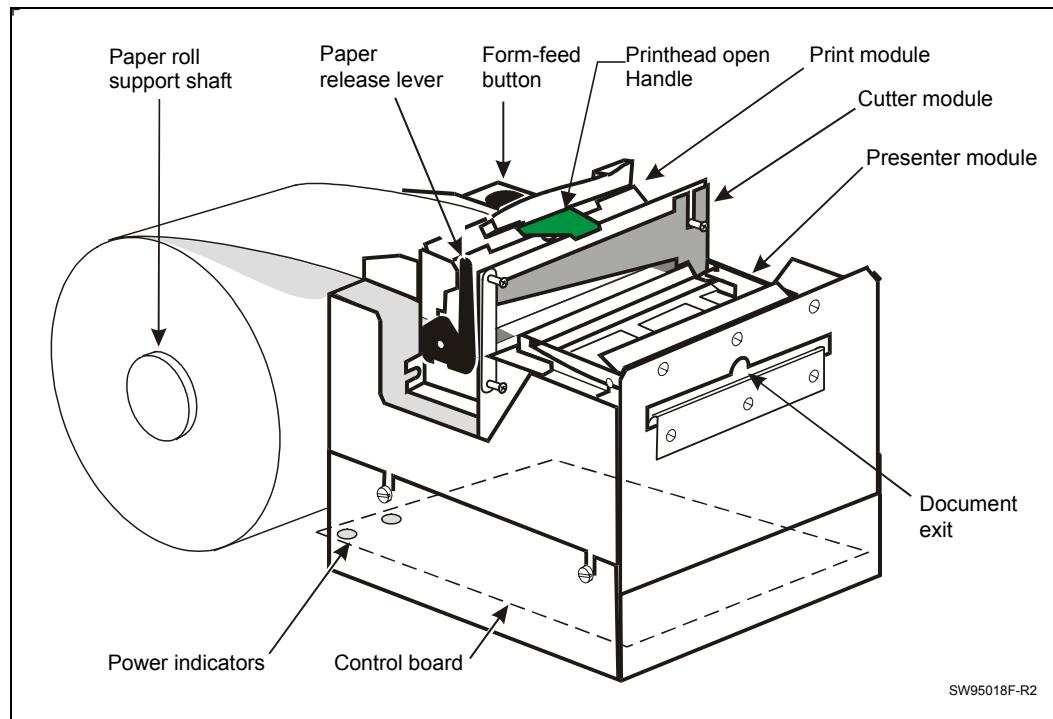


Figure 1. Basic TTP 52x0 printer

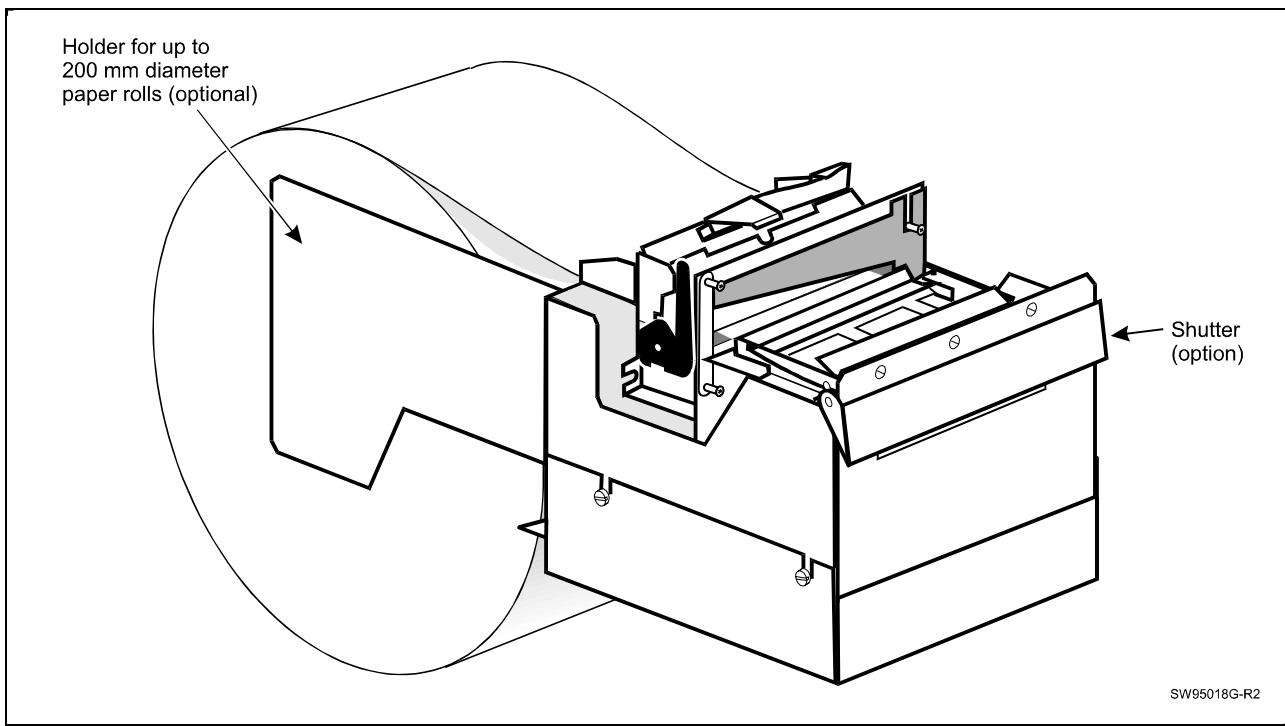


Figure 2. TTP 52x0 Series equipped with optional large roll holder and shutter.

2

FUNCTIONAL DESCRIPTION

The printer chassis is made up of a lower module containing the printer control board and an upper module containing the mechanical functions.

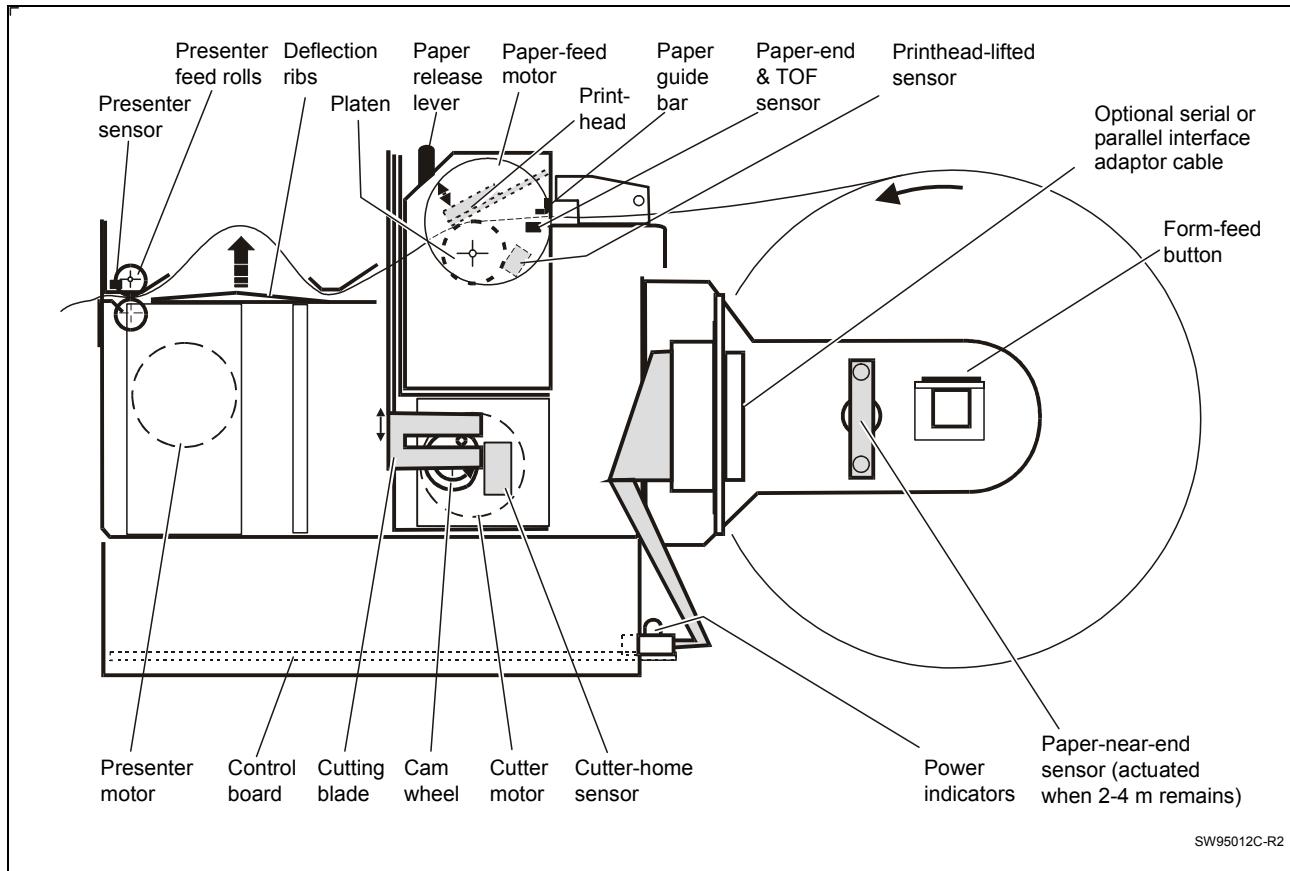


Figure 3. Printer design

The printer has three motors controlled by the control board firmware. All sensors are reflector-type opto-sensors, except the printhead-up and cutter-home sensors that are micro switches.

2.1

Paper handling

The print module has a stepper-motor that drives a platen. The thermal printhead presses against the platen with the temperature sensitive paper in-between. The platen pulls the paper from the supply roll and feeds the paper through the cutter module and up to a couple of feed rollers in the presenter module. The presenter motor (DC-motor) drives the rollers.

During the printing procedure, the firmware runs the presenter motor slowly until the presenter sensor detects the leading paper edge. The presenter feed rollers then stops and holds the top of the document. Deflection ribs in the presenter module assist in forming a document loop within the printer when the firmware postpones the presentation until printing and cutting is completed. The presenter motor will then present the document to the customer. If so selected by the application program, the presenter feed rollers can be set at continuous feed-through during printing, for example, when very long documents are being printed.

The presenter sensor also detects when the trailing document edge leaves the exit slot.

The combined paper-end and TOF sensor is actuated by light reflection against the back of the paper. If the light reflection disappears, but returns within a specified number of paper-feed motor steps, this means that a pre-printed black mark is detected. If the light does not return before this number of motor steps has been effected, this will be interpreted as paper end.

2.2

Paper near-end detection

All Swecoin roll holders have an optical reflection sensor that becomes actuated when there is about 3 m paper left (see Figure 3). This is the paper near end sensor.

In addition, the optional paper roll holders for larger paper rolls have an adjustable paper level sensor (see Figure 4) that can be used, for example, to decide whether or not the remaining paper will last during a weekend, thus called "Weekend sensor".

The paper end & TOF sensor (reflector sensor) inhibits printing if there is no paper at all in the printer module.

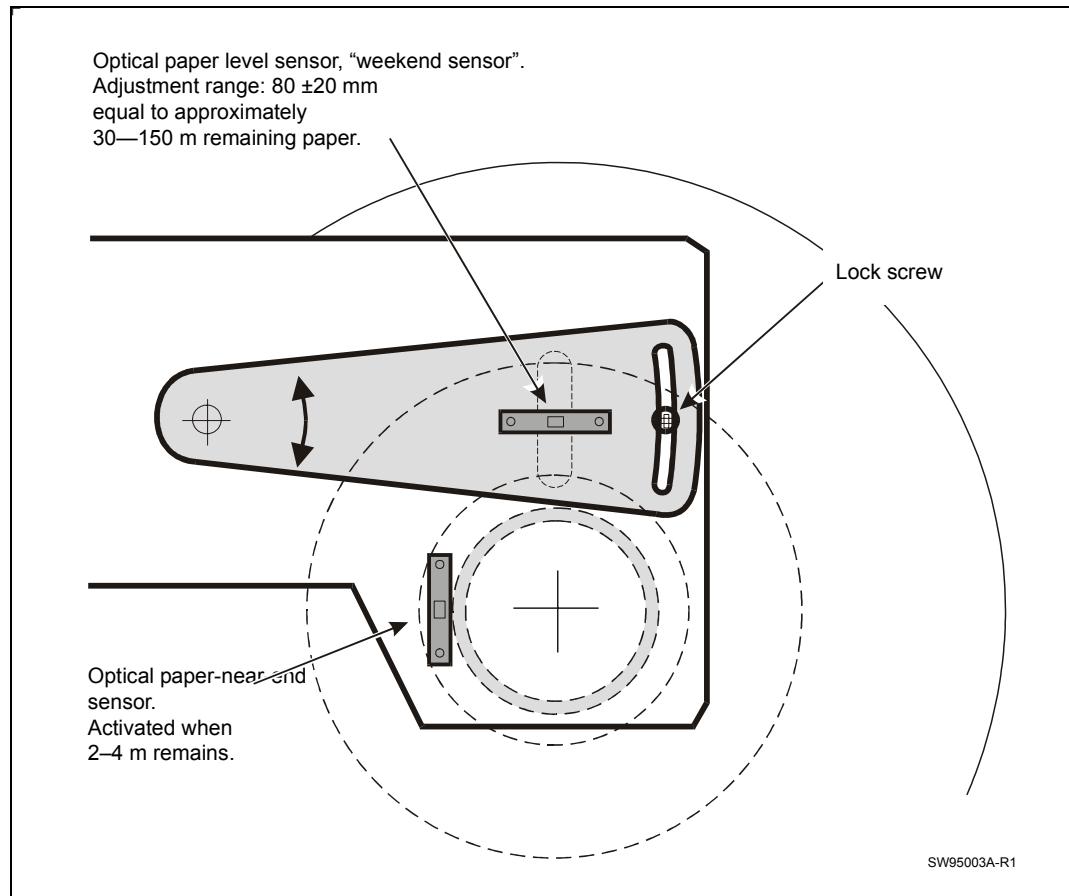


Figure 4. Paper sensor roll holder for 200-mm diameter rolls (optional)

2.3

Paper jam detection

The application program knows the length of each document. If the presenter sensor does not detect the leading edge of a document when expected, this will be interpreted as if paper jam has occurred. Paper jam error will also be signaled if the presenter sensor detects paper in unexpected situations.

2.4

Cutting

The cutter module moves the cutting blade down (cutting), and then it returns up again to the home position. A DC-motor and a crank mechanism drive the cutter. A sensor detects when the blade reaches the home position.

A vertical leaf spring (not shown in the above figure) aids in keeping the free end of the movable knife blade pressed against the fixed cutting edge.

WARNING!

RISK OF INJURY! Depending on the position of the crank mechanism, the cutting knife may start moving when the printer is switched ON. KEEP HANDS AWAY WHEN SWITCHING ON THE PRINTER.

2.5

Printhead-up detection

Lowering the paper release lever separates the printhead from the platen and actuates the printhead-up micro-switch sensor. This sets a status bit in the status message.

Printing is interrupted as long as the printhead is lifted.

Lowering the paper release lever is also part of the procedure for setting the printer in a HEX dump mode for logging the data transfer between the host and the printer. See page 13.

CAUTION! — If the printer is not going to be used for a week or more, disengage the printhead from the platen by lowering the paper release lever. Both the printhead and the platen can otherwise be deformed.

2.6

Electronics

Also see logic diagrams in Chapter 4.3.3.

2.6.1

Microprocessor system

The control board is equipped with an 80C320 microprocessor. The TTP 52x0-printers meet the EMC directives for CE marking.

2.6.2

Static RAM

The control board has 256 Kbyte static RAM used for buffering of graphics data during printing. It allows full landscape printing (210 mm).

2.6.3

Flash PROM

A Flash PROM on the control board holds the printer firmware, fonts, parameter settings, etc. The flash PROM allows online downloading of its contents.

2.6.4

Printing

The control board controls the printing. It has four fonts installed, and possibility to hold four more custom designed fonts. Each font can be printed in it's standard size, double width, double height and quadruple size, in both portrait and landscape modes, as black on white background or the reverse, and with or without underline.

Bar code printing is available as well as bit map graphics. Print speed and paper transport speed is approximately 50 mm per second.

2.6.5

Cutting

When a cutting command is received, the control board first turns the DC-motor in one direction to perform the cutting until the cam on the cam wheel actuates the cutter-home sensor. This happens after one full revolution. At this moment, the motor is forced to a quick stop by momentarily reversing the voltage to the motor.

2.6.6

Communications interface

The control board has ribbon-cable connectors for both serial and parallel interface.

Adapter cables are available so that one can use standard serial or parallel printer cables to connect the printer to the host computer. The outer end of either cable can be attached to the paper roll holder frame using a bracket.

SERIAL INTERFACE

Each communication parameter can be changed separately through the applicable ESC command. Then the command ESC & 4 can be used to store the new settings as default parameters, otherwise when the printer is switched OFF, it will return to its old default settings.

A default parameter set-up containing several new or modified parameters can be downloaded and permanently stored using the command ESC & 2 n1 ... n41.

See the applicable Installation Manual for further information.

| Communication parameters | |
|--------------------------|---|
| Data transfer rate | 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 baud |
| Handshaking | Hardware XON / XOFF |
| Error reporting | Silent, or ACK / NAK + error code |
| Parity | None / Odd / Even |
| No. of data bits | 8 |
| No. of stop bits | 1 |
| No. of start bits | 1 |

PARALLEL INTERFACE

The parallel interface is a Centronics-type uni-directional interface.

See the applicable *Installation Manual* for more details.

2.6.7

Power supply

TTP 5200 requires +24VDC ±5% and +5V ±5% VDC input.

TTP 5250 requires +24VDC ±5% only.

Current consumption during text printing is 2 A average, and 6 A at peaks.

The consumption during all black, and dense, printing is 6 A average and 10 A at peaks.

Standby consumption is about 0.3 A.

3.1**Fault finding**

In connection with service of the printer system, it is good practice to clean the printer mechanism in order to remove paper dust and lint from the paper path, cutter and sensor areas. Paper dust, when accumulated, may interfere with printer functions such as reflector sensors.

Do not apply oil on the cutter blades since this might smudge the paper.

The printer informs the host of some error symptoms by means of status reports and error codes. See TTP 5200/5250 Installation Manual.

| Symptom | Suggested actions |
|---|---|
| Strange paper feed behavior. | <ul style="list-style-type: none"> Check that the presenter sensor is not affected by excessive ambient light from above or through the front opening. |
| Printing does not stop at paper out. | <ul style="list-style-type: none"> Check that the paper-out/TOF sensor is not affected by excessive ambient light. |
| Nothing is printed when you keep the form-feed button depressed while switching the printer ON, but the document is transported, cut and ejected. | <ul style="list-style-type: none"> Check that the paper roll is turned with the temperature-sensitive side facing up. Check that the paper meets the paper specification. *) Check that the ribbon cable connector at the top of the print module is fully inserted. |
| Test document can be produced as described above, but the printer works strangely in normal operation. | <ul style="list-style-type: none"> Check that both ends of the data cable are properly connected. Application program might be incorrect, for example, with respect to handshaking. Contact system manager. Make a HEX dump printout and check incoming data string. See page 13. |
| Printing is interrupted | <ul style="list-style-type: none"> Check if printer is out of paper. Check if there is any paper jam. Check that paper dust or pieces of paper do not block the presenter sensor. Check function of presenter sensor. Check that the printer is properly connected to protective earth. This is to prevent earth currents between printer and host, but also to prevent electro-static discharges. |

*) The paper specifications are available in the Technical Specifications.

| Symptom | Suggested actions |
|--|--|
| Printer does not work at all | <ul style="list-style-type: none"> Check that the paper release lever is in vertical position (print head presses against the paper). Check for paper jam between print module and cutter. If cutter is not in home position, check function of cutter home switch. Red and green voltage indicator lamps should be ON (visible from the rear of the printer). <p>If both lamps are OFF, check that the power cable is connected at both ends and that the power supply is switched ON. Check line-voltage-supply fuses.</p> <p>If only the red lamp is OFF, replace the PCB.</p> |
| No cutting | <ul style="list-style-type: none"> Check that the connector for the cutter motor and the cutter home sensor is fully seated on the control board. |
| Bad cutting (uneven top and bottom document edges) | <ul style="list-style-type: none"> Switch OFF, remove any obstructing paper particles in cutter and presenter modules. |
| Missing print or irregular spots | <ul style="list-style-type: none"> Paper may be too humid. Let the paper adapt to ambient temperature and humidity for approximately 24 hours before use. The paper used might not meet the paper specification. *) |
| White longitudinal lines in the printout | <ul style="list-style-type: none"> Clean printhead with isopropyl alcohol. Replace print module. |
| Faint print | <ul style="list-style-type: none"> The paper used might not meet the paper specification. *) Clean printhead with isopropyl alcohol. |
| Strange characters or graphics printed, or any kind of strange printer behavior. | <ul style="list-style-type: none"> Might be caused by erroneous data sent from the host. Check validity of transferred data by using the hex dump test function described below. Check setting of transmission speed and parity. |

3.2

Hex dump

Use the following procedure to set the printer in HEX dump mode:

1. Switch OFF the printer.
2. Lower the paper release lever.
3. Keep the form feed button depressed while you switch the printer ON again.
4. Raise the paper release lever. Until you switch OFF the printer, it will present all transferred data both in hexadecimal notation and as ASCII characters in two adjacent columns containing 8 bytes each. The printout is formatted for 60-mm page width.

Switching the printer OFF and ON again resets it to normal operating mode.

*) The paper specifications are available in the Technical Specifications.

Parts removal and replacement

⚠ WARNING!

RISK OF INJURY! Depending on the position of the crank mechanism in the cutting module, the cutting knife may start moving when the printer is switched ON.
KEEP HANDS AWAY!

⚠ CAUTION!

The printer power supply should be switched off, and the low-voltage power cable should be disconnected from the control board before you disconnect or connect any other cable on the control board. The printer electronics might otherwise be damaged.

⚠ CAUTION!

The printhead and some components on the control board are sensitive to ESD (electrostatic discharges). To prevent damaging such components, observe all the usual precautions such as keeping the part in its original packing ("ESD-bag") until you are ready to install the part. Do not touch its pins. Use a grounded wrist strap when handling ESD-sensitive components.

⚠ CAUTION!

If the printer or print module is not to be used for a week or so, disengage the printhead from the platen by lowering the paper release lever. Otherwise, both the printhead and the platen can be deformed.

3.3.1

Control board connectors

Se page 40.

3.3.2

Separating the upper and lower chassis modules

1. Loosen the four screws joining the two chassis modules.
2. Disconnect the cables at the rear edge of the control board.
3. Lift the upper module slightly and disconnect cables as required from the connector board so that you can place the upper module on its front panel in front of the bottom module.

3.3.3

TTP 5200 control board

REMOVAL

1. Separate the upper and lower chassis modules. See Section 3.3.2 above.
2. Remove the board (4 screws).

REPLACEMENT

1. Install the board in the reverse order.
2. It may be necessary to load the correct firmware version and/or user defined default settings after the board replacement. See *TTP 5200/5250 Installation Manual* for information on how to do this.

3.3.4

TTP 5250 control board

REMOVAL

1. Separate the upper and lower chassis modules. See Section 3.3.2 on page 14.
2. Remove the screw holding the voltage regulator U9 against the left-hand side of the lower chassis module. TTP5250/80 manufactured 2001 and later, and all TTP 5250/112 have an additional heatsink fitted behind the regulator.
3. Remove the board (4 screws).

REPLACEMENT

1. Install the board in the reverse order.

CAUTION! — To avoid overheating, fasten the 5V regulator firmly against the chassis with the heatsink in-between.

2. It may be necessary to load the correct firmware version and/or user defined default settings after the board replacement. See *TTP 5200/5250 Installation Manual* for information on how to do this.

3.3.5

Print module

REMOVAL

1. Tilt the print module by pulling the green handle backwards.
2. Remove the two screws holding the print module to the hinge plate.
3. Cut the tiewrap holding the cables to the hinge plate.
4. Disconnect the ribbon cable from the printhead.
5. Loosen the lower chassis module and disconnect the motor and sensor-cables from the control board.
6. Remove the print module.

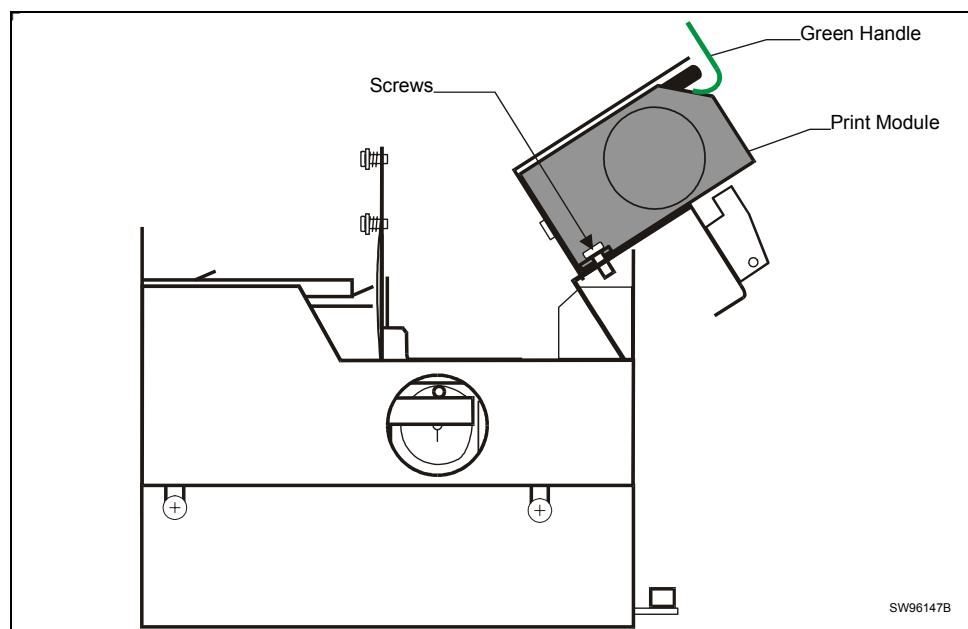


Figure 5. Loosening the print module

REPLACEMENT

1. Install the print module in the reverse order
2. Fit new tie wraps
3. Remember to move the green handle over to the replacement print module

3.3.6

Cutter module

REMOVAL

1. Separate the upper and lower chassis modules. See Section 3.3.2 on page 14.
2. Disconnect all cables from the control board.
3. With the upper chassis module standing on its front, remove the two uppermost screws from the underside of the module.

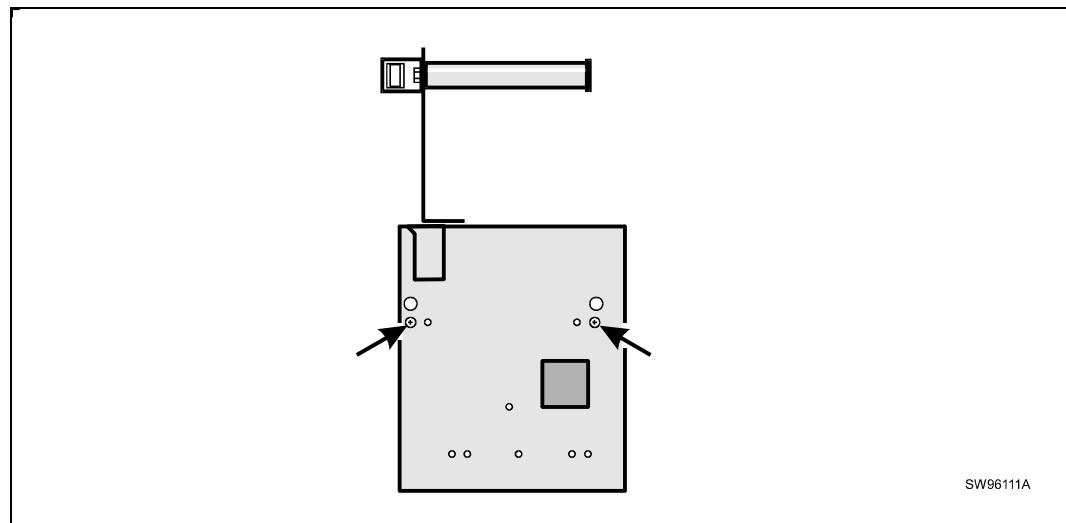


Figure 6. Loosening the cutter module

4. Remove the cutter module assembly.

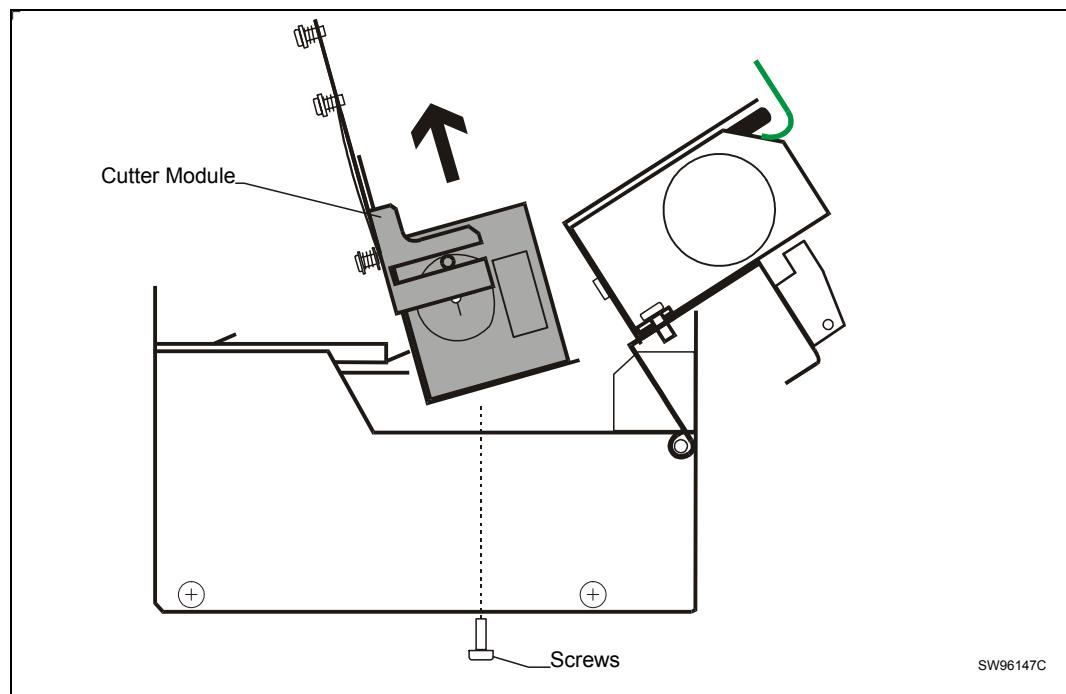


Figure 7. Lift the cutter module up after removing the screws.

REPLACEMENT

1. Install the cutter module in the reverse order. Make sure no cables are jammed under the module. See page 40 for correct connector positions.
2. Check that there is a 0.2 – 0.5-mm distance at any point between the rear edge of the presenter module and the cutting knife (you must manually turn the cutter-motor so that the moving blade is in its lowest position when measuring). If necessary, adjust by loosening the fixing screws of the print and cutter module assembly.

A too big distance might cause the paper running down between the cutter and the presenter modules, and a too short distance will fold the paper in the rear edge of the receipt.

Should the adjustment range be insufficient, also the cover plate of the presenter module, and the presenter module position can be adjusted slightly.

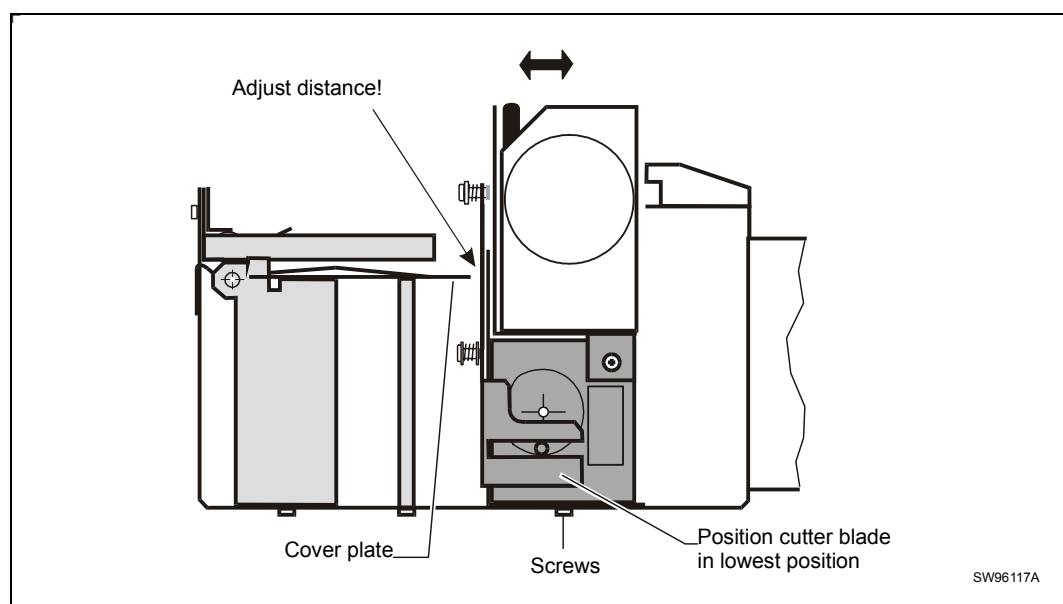


Figure 8. Adjusting the distance between presenter motor and cutting knife

3.3.7

Presenter module

REMOVAL

1. Separate the upper and lower chassis modules. See Section 3.3.2 page 14.
2. Disconnect all cables from the control board.
3. With the upper chassis module standing on its front, remove the three lower screws.

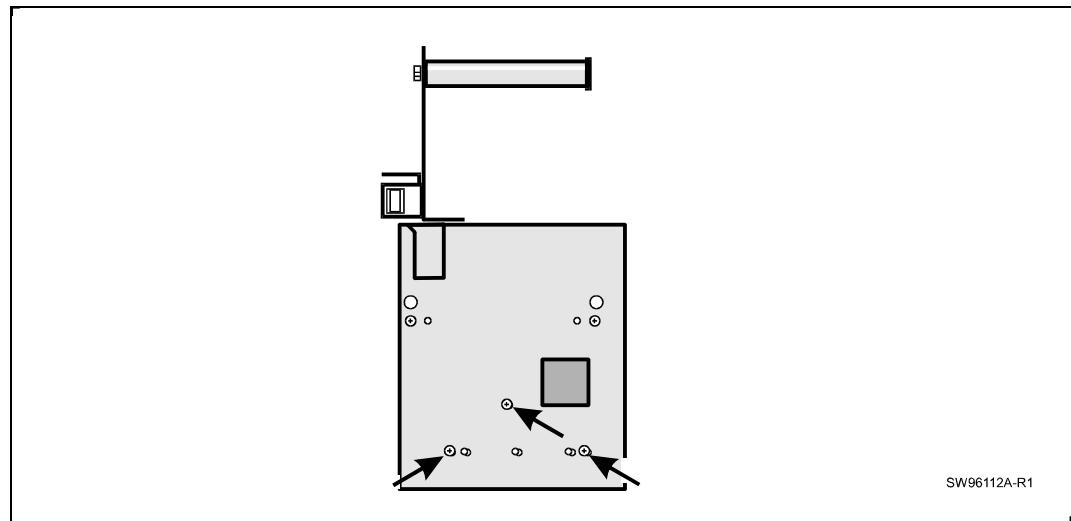


Figure 9. Preparations for removing the presenter module

4. Open the cable clip at the back of the printer front. See figure below.
5. Put the upper chassis module back to normal position and remove the two upper screws at the front of the upper chassis module.

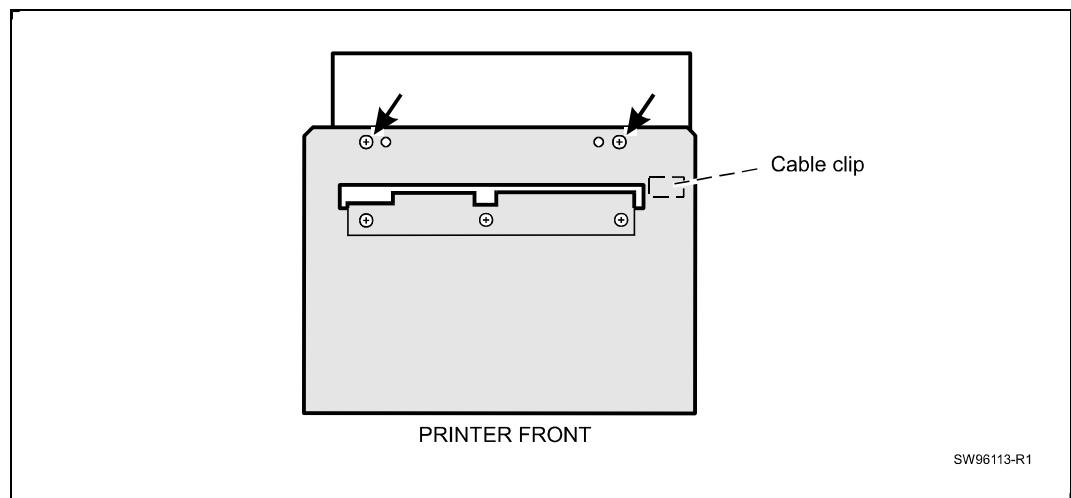


Figure 10. Loosening the presenter module

6. Remove the presenter module.

REPLACEMENT

1. Push the moving blade of the cutter down to its bottom position.
2. Install the presenter module in the reverse order. See page 40 for correct connector positions.
3. Check that there is a 0.2-0.5 mm distance at any point between the rear edge of the presenter module and the cutting knife. If necessary, adjust by loosening the fixing screws of the print and cutter module assembly. A too big distance might cause the paper running down between the cutter and presenter modules. See Figure 8.

3.3.8

Printhead



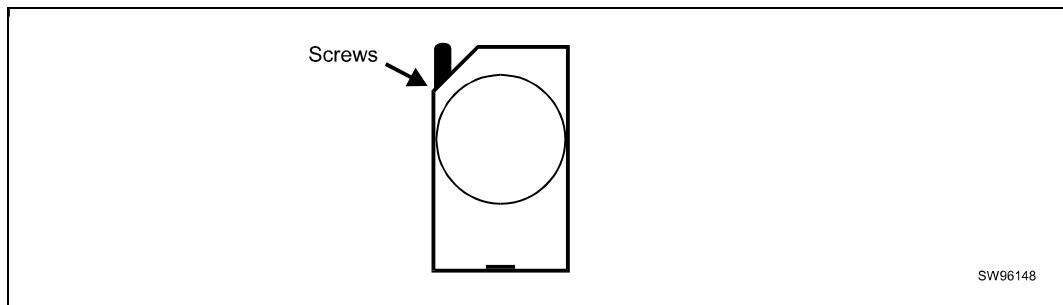
CAUTION!

The printhead is sensitive to ESD (electrostatic discharges). Observe all the usual precautions such as keeping the printhead in a protective "ESD-bag" until you are ready to install the printhead. Do not touch its connector pins. Use a grounded wrist strap when handling ESD-sensitive components.

REMOVAL FOR CLEANING

NOTE! – This can be done without removing the print module from the printer.

1. Verify that the paper release lever is in upright position.
1. Disconnect the ribbon cable from the printhead.
2. Loosen the springs for the printhead tilt mechanism.
3. Remove the two screws (/60 & /80) or three screws (/112) fixing the printhead. You can reach the screws through holes in the angled plate at the top of the print module.



SW96148

Figure 11. Preparations for removing the presenter module

4. Lower the printhead release lever to horizontal position.
5. Slide the printhead gently out backwards.

REPLACEMENT

Assemble the printer in the reverse order.

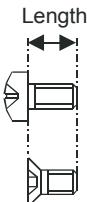
4

SPARE PARTS

Items coded **SP** are standard spare parts.

1. Screws, washers, nuts etc. are available in a common hardware store, and are thus not supplied as spare parts.
2. Parts that are considered as not being worn by normal printer use are not spare parts, for example the printer chassis.

Should you require any of these "non-spare parts", contact Swecoin for advice. Other price and delivery conditions may apply for non-coded items.

| Standard hardware | | | |
|------------------------|--|---|---|
| Designation example | How to interpret the designation | Illustration | How to measure |
| Screw MRX-H M3x5 | Panhead screw. Thread: M3. Length: 5 mm |   |  Length |
| Screw MFX-H M3x6 | Countersunk screw. Thread: M3. Length: 6 mm |   | |
| Screw M6S M6x16 | Hex head screw. Thread: M6. Length: 16 mm |   | |
| Screw MC6S M6x12 | Allen-head screw. Thread: M6. Length: 12 mm |   | |
| Screw FXS-H ST 2.9x6.5 | Countersunk Screw. Self-threading. Ø2.9 mm. Length: 6.5 mm |   | |
| Screw, RXK-H ST 2.9x8 | Panhead screw, Self-threading. Ø2.9mm. Length:8 mm |   | |
| Screw RTK ST 2.9x6.5 | Torx panhead screw, Self-threading. Ø2.9mm. Length: 6.5 mm |   | |
| Nut M6M M2 | Hex nut, M2 thread |   | |

DO NOT OVER-TIGHTEN THE SCREWS!

The max torque for the different screw sizes are as follows:

M2 = 0,13 Nm

M2.5 = 0,26 Nm

M3 = 0,46 Nm

M4 = 1.1 Nm

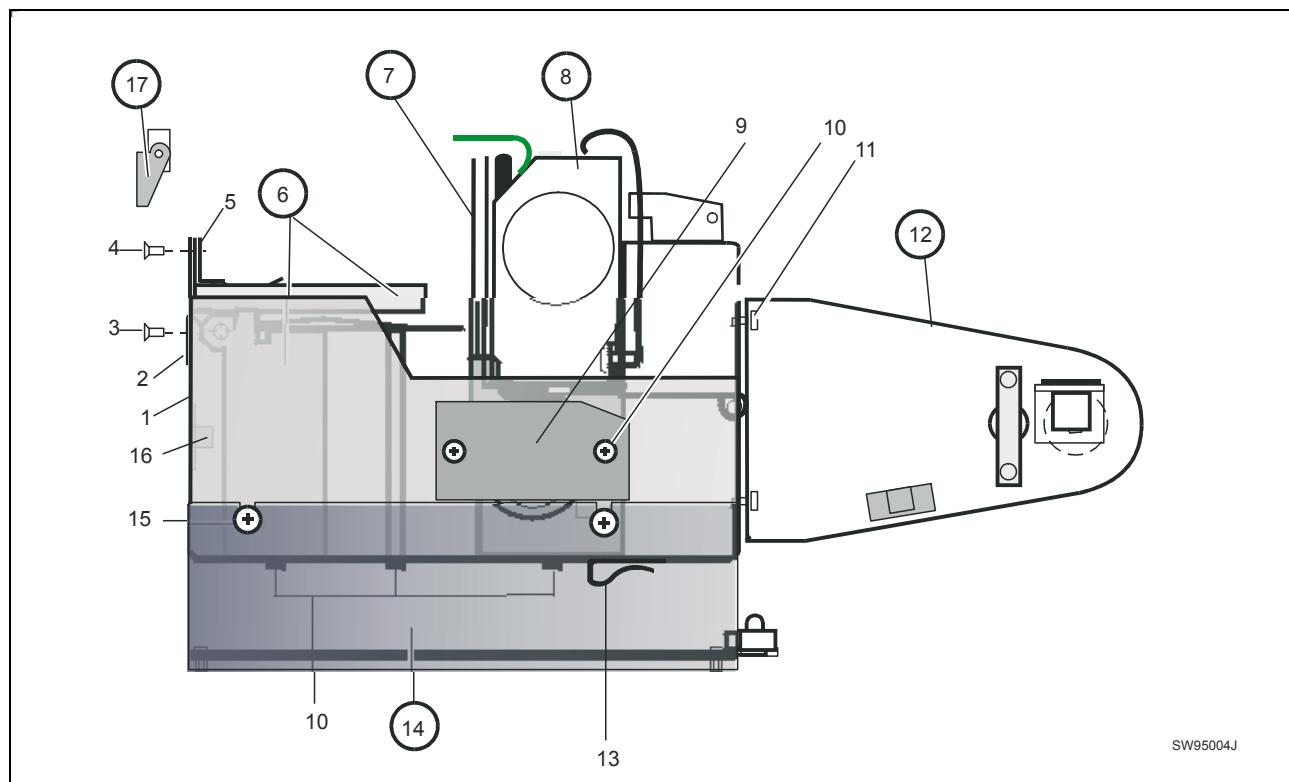
Threadlock like Locktite 243 should be used on screws that hold plastic parts, for instance the screws for the micro-switches.

4.2

Printer complete

4.2.1

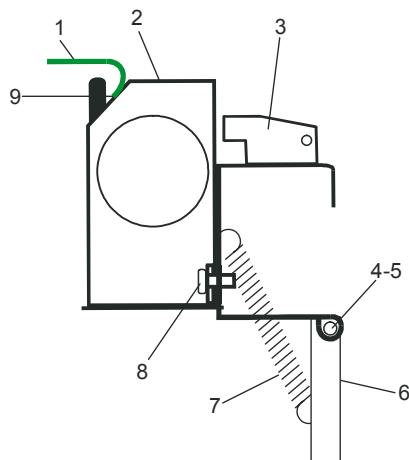
Final assembly



| Pos. | Part No. Code | 60 mm 00483-000 | 80 mm 00471-000 | 112 mm 100841 | Designation | Qty. | Remarks |
|------|------------------|--------------------|--------------------|------------------|---------------------|------|-----------------------|
| 1 | SP | 00483-112 | | | Print mech. Support | 1 | |
| 2 | SP | 100934 | 00471-000 | 100841 | Paper guide, front | 1 | |
| 3 | | 09101-191 | | | Screw MFX M2.5x6 | 3 | |
| 4 | | 09101-220 | | | Screw MFX-H M3x6 | 3 | |
| 5 | SP | 01486-060 | 01486-080 | 00615-112 | Shaft stop | 1 | |
| 6 | SP | 00540-060 | 00540-080 | 00540-112 | Presenter module | 1 | See page 24 |
| 7 | SP | 00419-060 | 00419-080 | 00419-112 | Cutter module | 1 | See page 26 |
| 8 | | 01198-060 | 01198-080 | 01198-112 | Print module | 1 | See page 27 |
| 9 | | 00805-000 | | | Protection plate | 1 | Option |
| 10 | | 09100-219 | | | Screw MRX-H M3x5 | 10 | |
| 11 | | 09100-285 | | | Screw MRX-H M4x6 | 4 | |
| 12 | SP | 01601-060 | 01601-080 | 01601-112 | Roll holder assy | 1 | See pages 28, 32 – 35 |
| 13 | | 01313-000 | | | Ribbon cable clips | 1 | |
| 14 | | — | — | — | PCB cover assy. | 1 | See page 29 |
| 15 | | 09100-285 | | | Screw MRX-H M4x6 | 4 | |
| 16 | SP | 00358-000 | | | Cable clamp | 1 | |
| 17 | | | | | Shutter option | | See page 31 |

4.2.2

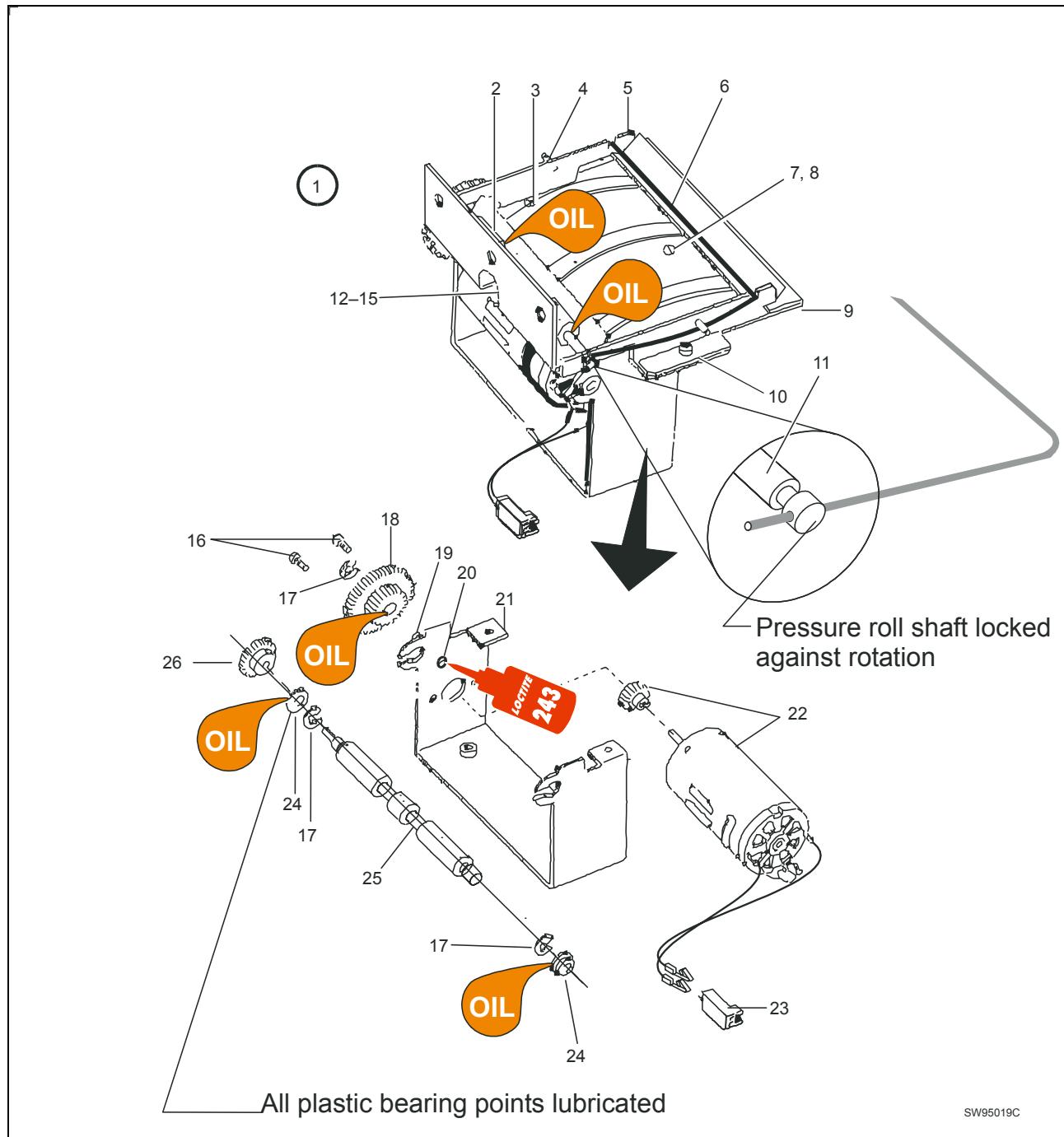
Print module



SW01018

| Pos. | Code | 60 mm | Part No. 80 mm | 112 mm | Designation | Qty. | Remarks |
|------|------|-----------|-------------------|-----------|--------------------------|------|----------------|
| 0 | | 01198-060 | 01198-080 | 01198-112 | Print module | 1 | |
| 1 | | | 01093-000 | | - Handle | 1 | |
| 2 | SP | 01681-060 | 01681-080 | 01681-112 | - Thermal print assy | 1 | See below |
| 3 | SP | 01056-060 | 01056-080 | 01056-112 | - Paper guide | 1 | |
| 4 | | | 01208-000 | | - Tube spacer DRM 2550x2 | 2 | |
| 5 | | | 09100-191 | | - Screw MRX-H M2.5x6 | 2 | |
| 6 | SP | 01086-080 | | 01086-112 | - Mounting plate | 1 | |
| 7 | | | 01087-000 | | - Tension spring | 1 | 2 pcs on 112mm |
| 8 | | | 09100-218 | | - Screw MRX-H M3x4 | 2 | |
| 9 | | | 09010-218 | | - Screw RXK-H ST 2.9x4.5 | 2 | |

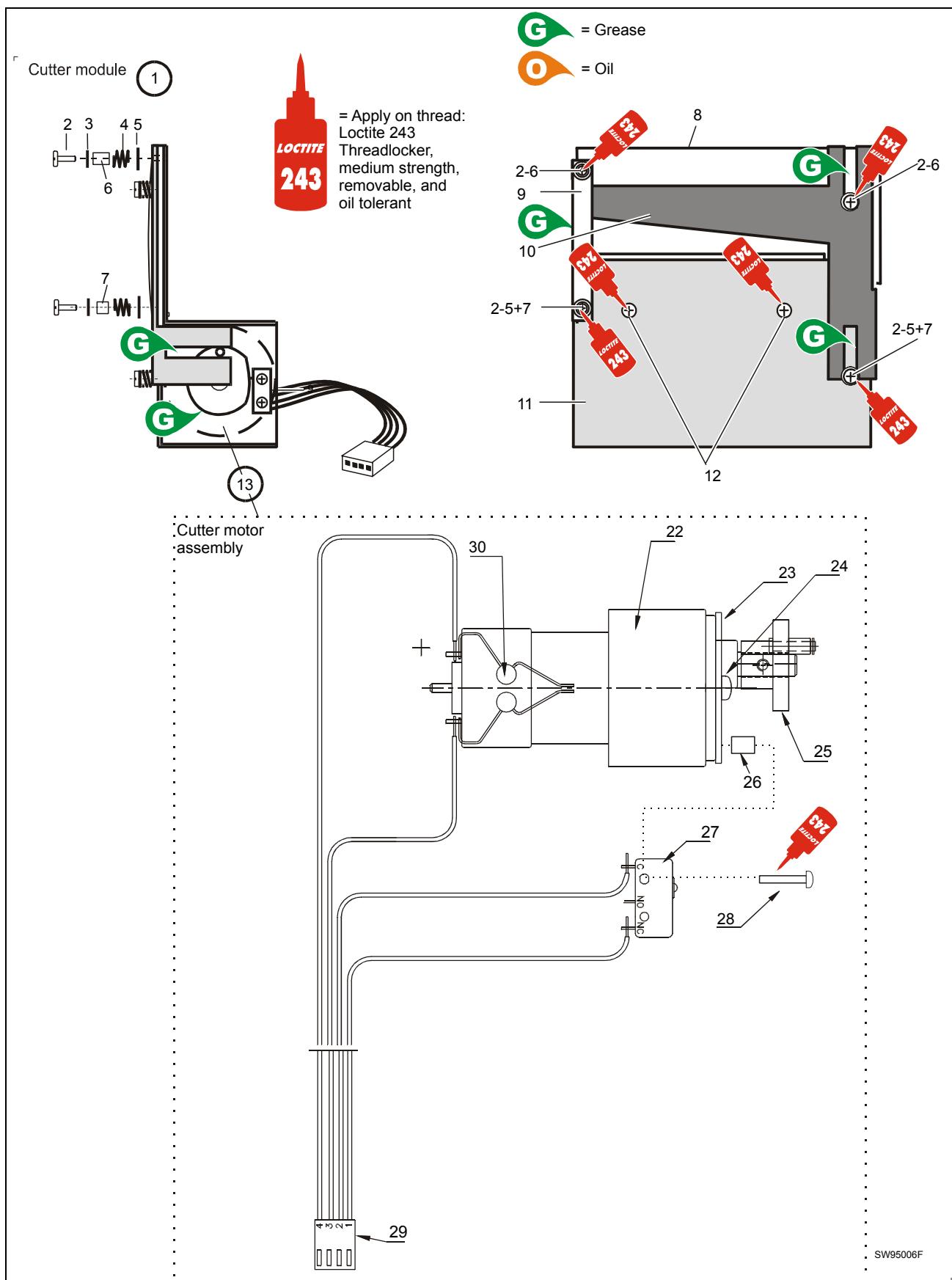
| Pos. | Code | 60 mm | Part No. 80 mm | 112 mm | Designation | Qty. | Remarks |
|------|------|-----------|-------------------|-----------|---------------------------|------|---------|
| 2 | | 01681-060 | 01681-080 | 01681-112 | Thermal print assy | 1 | |
| | SP | 00538-060 | 00538-080 | 00538-112 | - Thermal print mechanism | 1 | |
| | | | 00784-000 | | - Tie-wrap, 99x2.5mm | 3 | |
| | SP | 10603-000 | | 10603-001 | - Pinthead cable assy | 1 | |



| Pos. | Code | Part No. | | | Designation | Qty. | Remarks |
|------|------|-----------|-----------|-----------|--------------------------|------|---------|
| | | 60 mm | 80 mm | 112 mm | | | |
| 1 | SP | 00540-060 | 00540-080 | 00540-112 | Presenter Module Assy | 1 | |
| 2 | SP | 00253-000 | | - | | 2 | |
| 3 | | 09002-163 | | - | | 2 | |
| 4 | | | | 00392-000 | - Slotted pin, RPA 2x6 | 2 | |
| 5 | SP | 01169-060 | 01169-080 | 00470-112 | - Guide plate | 1 | |
| 6 | SP | 00272-060 | 00272-080 | 00272-112 | - Wire spring, presenter | 1 | |
| 7 | | — | — | 09101-220 | - Screw MFX-H M3x6 | 1 | |
| 8 | SP | — | — | 00487-000 | - Spacer | 1 | |
| 9 | SP | 01170-060 | 01170-080 | 00473-112 | - Guide plate, lower | 1 | |
| 10 | | 09100-189 | | - | | 6 | |
| 11 | SP | 00488-000 | 00488-000 | 00506-112 | - Pressure roll shaft | 1 | |
| 12 | SP | 10618-001 | | - | | 1 | |
| 13 | | 02380-000 | | — | - Tube spacer DRM 2240x5 | 2 | |
| 13 | | — | — | 01332-000 | - Tube spacer DRM 2550x5 | 2 | |
| 14 | | 09101-195 | 09101-195 | 09101-168 | - Screw MFX-H M2x10 | 2 | |
| 15 | | 09022-309 | | - | | 2 | |
| 16 | | 09000-190 | | - | | 2 | |
| 17 | | 09045-107 | | - | | 3 | |
| 18 | SP | 00375-000 | | - | | 1 | |
| 19 | | 00250-000 | | - | | 1 | |
| 20 | | 09100-191 | | - | | 1 | |
| 21 | SP | 00475-060 | 00475-080 | 00475-112 | - Motor bracket | 1 | |
| 22 | SP | 01155-000 | | - | | 1 | |
| 23 | SP | 01050-004 | | - | | 1 | 4-pole |
| 24 | | 00251-000 | | - | | 2 | |
| 25 | SP | 00469-060 | 00469-080 | 00544-112 | - Feed roller assy | 1 | |
| 26 | | 00255-000 | | - | | 1 | |

4.2.4

Cutter assembly



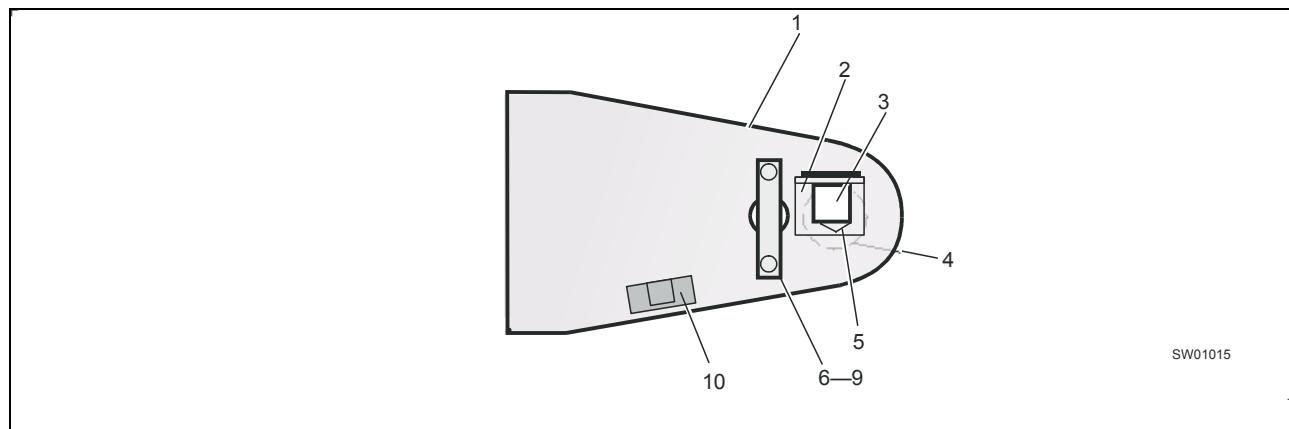
CUTTER MODULE

| Pos. | Code | 60 mm | Part No. 80 mm | 112 mm | Designation | Qty. | Remarks |
|-------------|-------------|--------------|---------------------------|---------------|---------------------------------|-------------|----------------|
| 1 | SP | 00419-060 | 00419-080 | 00419-112 | Cutter module | 1 | |
| 2 | | | 09100-195 | | – Screw MRX-H M2.5x10 | 4 | |
| 3 | | | 09023-118 | | – Washer BRB 2.7x6x0.5 | 4 | |
| 4 | SP | | 00557-000 | | – Compression spring 0.4x5x11.2 | 4 | |
| 5 | | | 09023-136 | | – Washer BRB 4.3x8x0.8 | 4 | |
| 6 | SP | | 00555-001 | | – Hub 6.5mm | 2 | |
| 7 | SP | | 00555-000 | | – Hub 5mm | 2 | |
| 8 | | 00550-060 | 00550-080 | 00550-112 | – Print mech. Support | 1 | |
| 9 | SP | | 00556-000 | | – Pressure plate | 1 | |
| 10 | SP | 00551-060 | 00551-080 | 00551-112 | – Cutter blade, moving | 1 | |
| 11 | SP | 00549-060 | 00549-080 | 00549-112 | – Cutter support/fixed blade | 1 | |
| 12 | | | 09100-189 | | – Screw MRX-H M2.5x4 | 2 | |
| 13 | SP | | 10622-001 | | – Cutter motor assy | 1 | |

CUTTER MOTOR ASSEMBLY

| Pos. | Code | 60 mm | Part No. 80 mm | 112 mm | Designation | Qty. | Remarks |
|-------------|-------------|--------------|---------------------------|---------------|---------------------------------|-------------|----------------|
| 13 | SP | | 10622-001 | | Cutter motor assy | 1 | |
| 22 | SP | | 00570-000 | | – DC motor with gearbox | 1 | |
| 23 | | | 00552-000 | | – Motor bracket | 1 | |
| 24 | | | 09100-218 | | – Screw MRX-H M3x4 | 3 | |
| 25 | SP | | 01094-000 | | – Cam wheel assy | 1 | |
| 26 | | | 00130-000 | | – Tube spacer DRM 2240x12 | 2 | |
| 27 | SP | | 00372-000 | | – Micro switch, gold plated xc3 | 1 | |
| 27 | SP | | 100926 | | – Micro switch, with arm | 1 | |
| 28 | | | 09000-174 | | – Screw MCS-H M2x20 | 2 | |
| 29 | SP | | 10622-000 | | – Cutter motor cable assy | 1 | |
| 30 | | | 00394-000 | | – Capacitor 47nF 50V | 2 | |

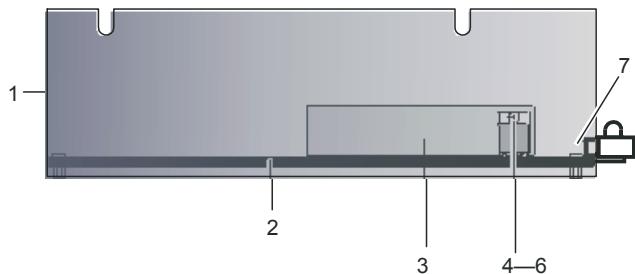
4.2.5

Roll holder assembly, Standard

| Pos. | Code | 60 mm | Part No. 80 mm | 112 mm | Designation | Qty. | Remarks |
|------|------|-----------|-------------------|-----------|--------------------------|------|---------|
| 0 | SP | 01601-060 | 01601-080 | 01601-112 | Roll holder assy | 1 | |
| 1 | SP | 00622-060 | 00622-080 | 00622-112 | – Roll holder bracket | 1 | |
| 2 | | | 00688-000 | | – Switch bracket | 1 | |
| 3 | SP | | 10730-000 | | – Feed button assy | 1 | |
| 4 | | 00486-060 | 00486-080 | 00486-112 | – Paper roll shaft | 1 | |
| 5 | | | 09007-368 | | – Screw M6S M6x16 | 1 | |
| 6 | | | 09101-166 | | – Screw MFX-H M2x8 | 2 | |
| 7 | | | 01669-000 | | – Tube spacer DRM 2240x3 | 2 | |
| 8 | SP | | 10618-001 | | – Opto sensor assy | 1 | |
| 9 | | | 09022-307 | | – Nut M6M M2 | 2 | |
| 10 | SP | | 00358-000 | | – Cable clamp | 1 | |

4.2.6

PCB cover assy. Standard

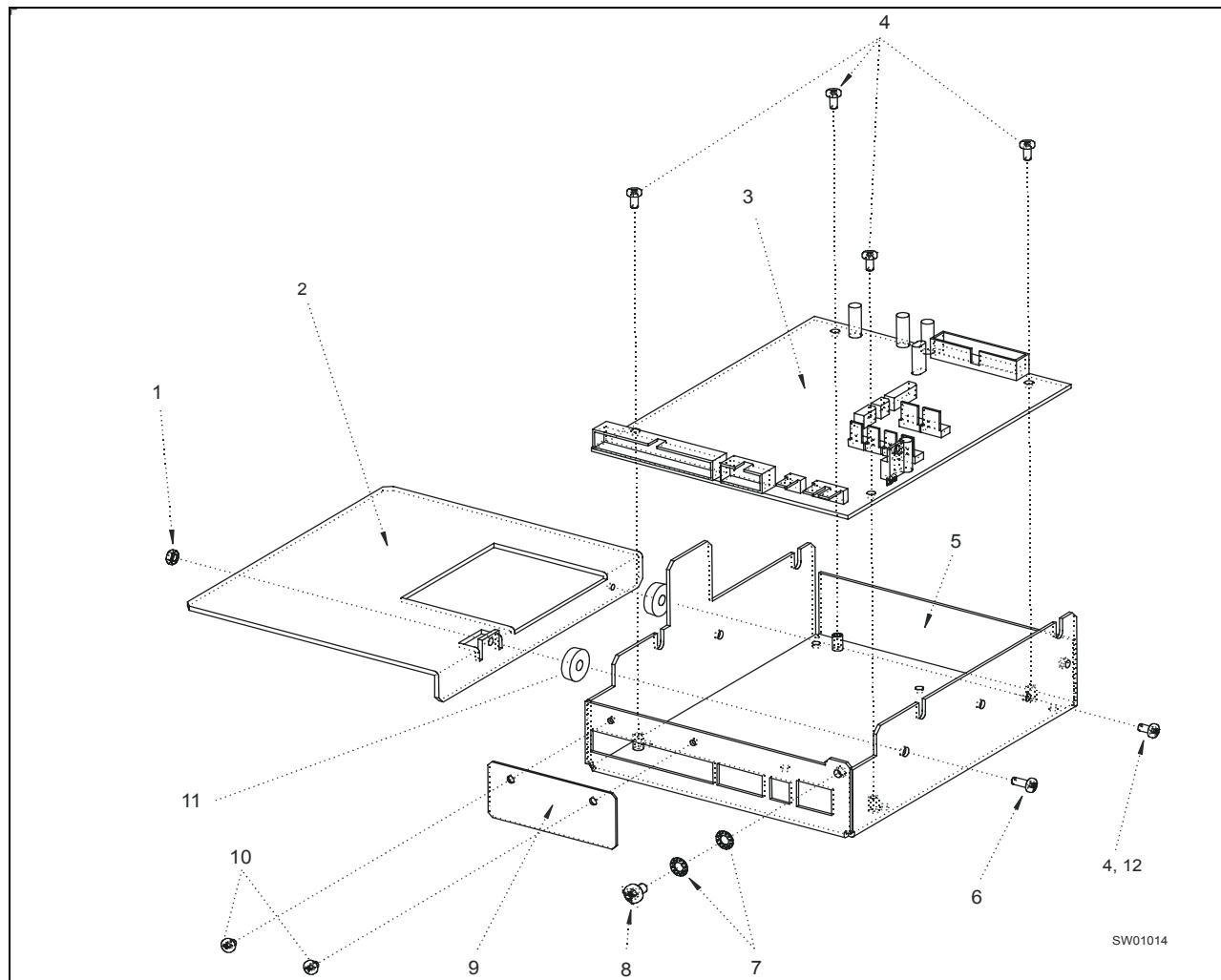


SW01013

| Pos. | Code | Part No. | | | Designation | Qty. | Remarks |
|------|------|-----------|-----------|-----------|---------------------------|------|------------|
| | | 60 mm | 80 mm | 112 mm | | | |
| 1 | SP | 00484-080 | | 00484-112 | PCB cover | 1 | |
| 2 | SP | | 00728-002 | | – Control board TTP 5200 | 1 | |
| 2 | SP | | 00728-003 | | – Control board TTP 5250 | 1 | |
| 2 | SP | | 00728-006 | | – Control board TTP 5250 | 1 | With hooks |
| 3 | SP | 01252-080 | 01252-080 | 01252-112 | – Heatsink | 1 | |
| | | — | — | 101033 | – Heatsink, Angle bracket | (1) | Option |
| 4 | | — | — | 09100-197 | – Screw MRX-H M2.5x12 | 1 | |
| 4 | | 09100-193 | | — | – Screw MRX-H M2.5x8 | 1 | |
| 5 | | 09024-120 | | | – Spring washer FBB 2.7 | 1 | |
| 6 | | 09022-309 | | | – Nut M6M M2.5 | 1 | |
| 7 | | 09100-219 | | | – Screw MRX-H M3x5 | 4 | |

4.2.7

PCB cover assy. Closed (option)



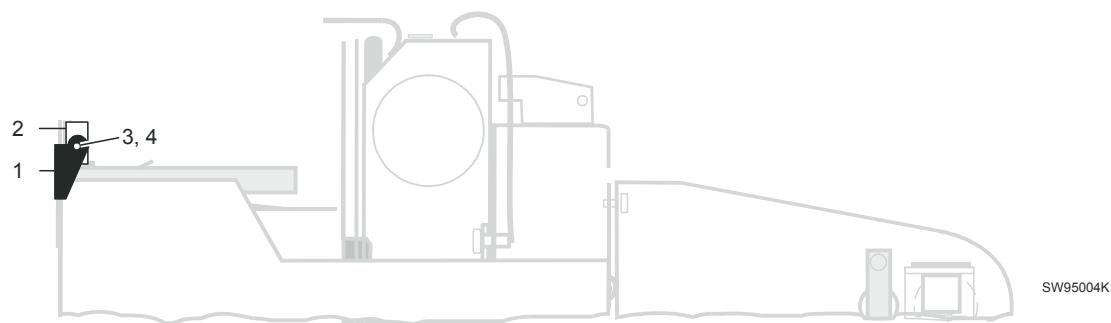
| Pos. | Code | Part No. | | | Designation | Qty. | Remarks |
|------|------|-----------|-----------|-----------|--------------------------|------|---------|
| | | 60 mm | 80 mm | 112 mm | | | |
| 0 | | | 101131 | 101170 | PCB cover assy | | |
| 1 | | | 09022-310 | | - Nut M6M M3 | 1 | |
| 2 | SP | | 101133 | | - Heatsink | 1 | |
| 3 | SP | | 00728-003 | | - Control board TTP 5250 | 1 | |
| 4 | | | 09100-220 | | - Screw MRX-H M3x6 | 5 | |
| 5 | | 101130 | 101130 | 101171 | - PCB cover | 1 | |
| 6 | | 09100-222 | | — | - Screw MRX-H M3x8 | 1 | |
| 7 | | | 09026-136 | | - Lock washer AZ 4.3 fzb | 2 | |
| 8 | | | 09100-285 | | - Screw MRX-H M4x6 | 1 | |
| 9 | SP | | 101282 | | - Cover plate | 1 | |
| 10 | | | 09100-217 | | - Screw MRX-H M3x3 | 2 | |
| 11 | SP | — | — | 101173 | - Spacer | 2 | |
| 12 | | — | — | 09100-226 | - Screw MRX-H M3x12 | 1 | |

4.3

Options

4.3.1

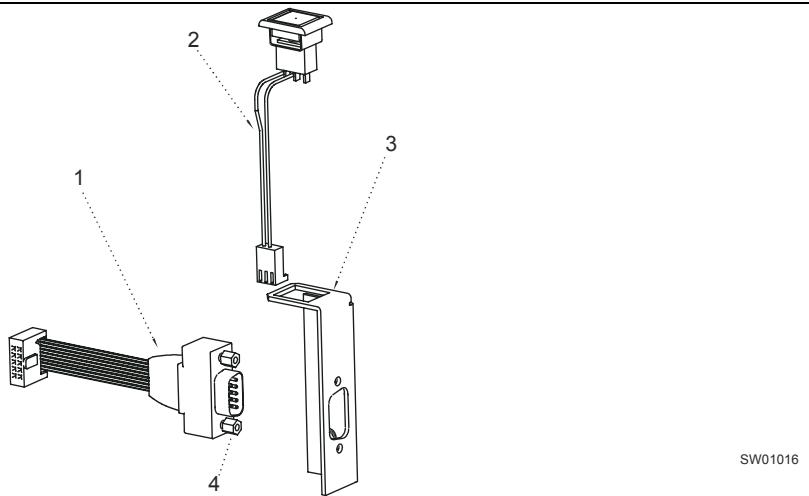
Shutter



| Pos. | Code | Part No. | | | Designation | Qty. | Remarks |
|------|------|-----------|-----------|-----------|------------------|------|---------|
| | | 60 mm | 80 mm | 112 mm | | | |
| 0 | | 01485-060 | 01485-080 | 01485-112 | Shutter assy. | | |
| 1 | SP | 00644-060 | 00644-080 | 00644-112 | – Shutter | 1 | |
| 2 | SP | 00643-060 | 00643-080 | 00643-112 | – Bracket | 1 | |
| 3 | SP | 00645-060 | 00645-080 | 00645-112 | – Rod | 1 | |
| 4 | — | 09045-106 | | | – Circlip RS 2.3 | 2 | |

4.3.2

Parallel and serial adapters

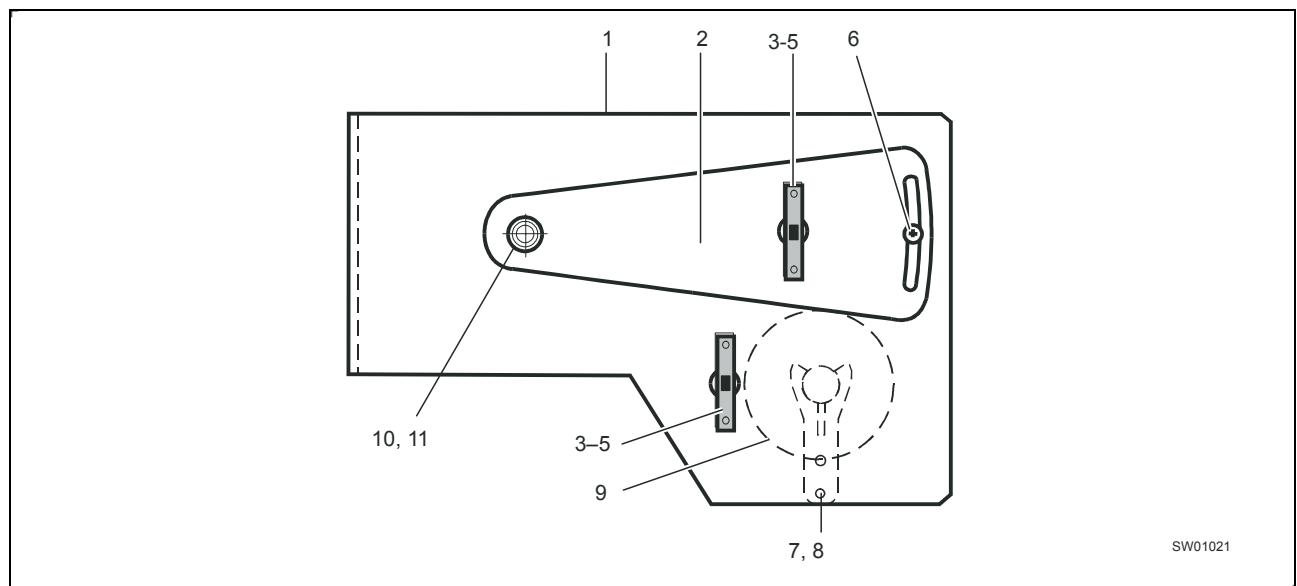


| Pos. | Code | Part No. | | | Designation | Qty. | Remarks |
|------|------|-----------|-------|--------|--|------|-------------------|
| | | 60 mm | 80 mm | 112 mm | | | |
| 0 | — | 101148 | | | Serial adapter/switch assy. | 1 | |
| 0 | — | 100975 | | | Parallel adapter/switch assy | 1 | |
| 1 | SP | 00601-000 | | | Parallel interface adapter | 1 | L=230 mm |
| 1 | SP | 101274 | | | Serial interface adapter | 1 | L=200 mm |
| 1 | SP | 00756-000 | | | Serial interface adapter with pin 4 and 7 interconnected | | L=200 mm |
| 3 | SP | 100851 | | | Connector bracket, serial | 1 | |
| 3 | SP | 01066-000 | | | Connector bracket, parallel | 1 | |
| 4 | — | 09100-222 | | | Skruv MRX-H M3x8 | 2 | For 36-pole conn. |
| 4 | — | 01003-000 | | | Spacer screw 4-40 UNC/M3 | 2 | For 9-pole D-sub |
| 4 | — | 09022-310 | | | Nut M6M 3 | 2 | |
| 4 | — | 09024-124 | | | Lock washer FBB 3.1 | 2 | |

4.3.3

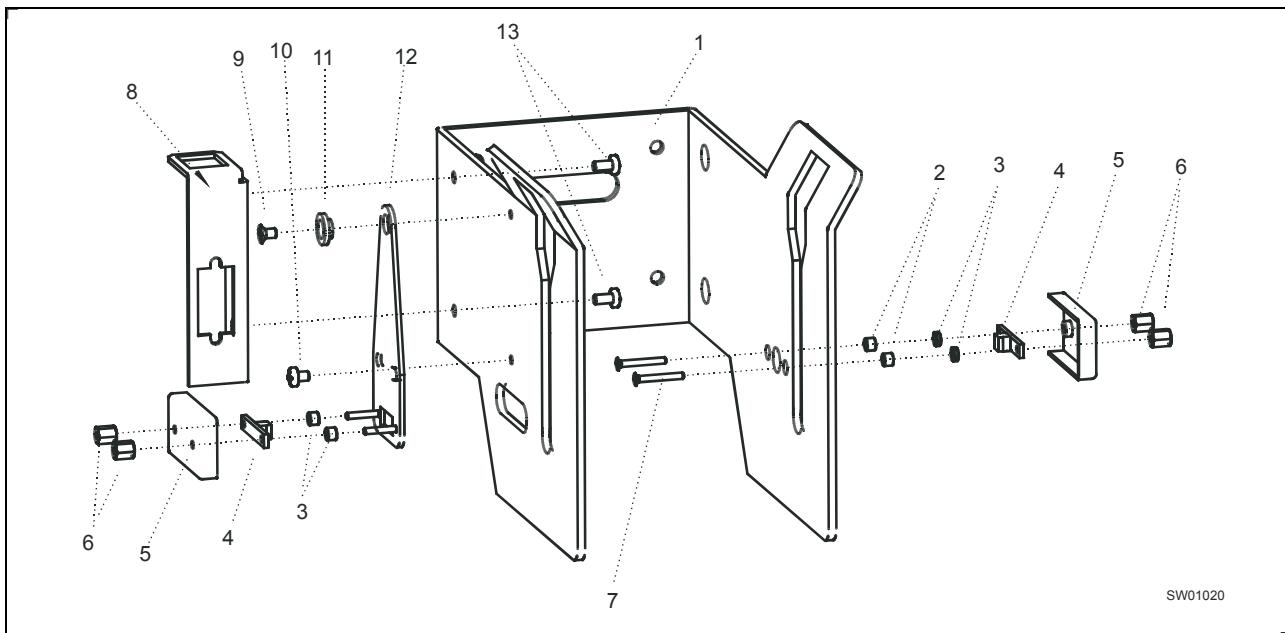
Roll holder assy, 200 mm (8") behind

GENERATION 1



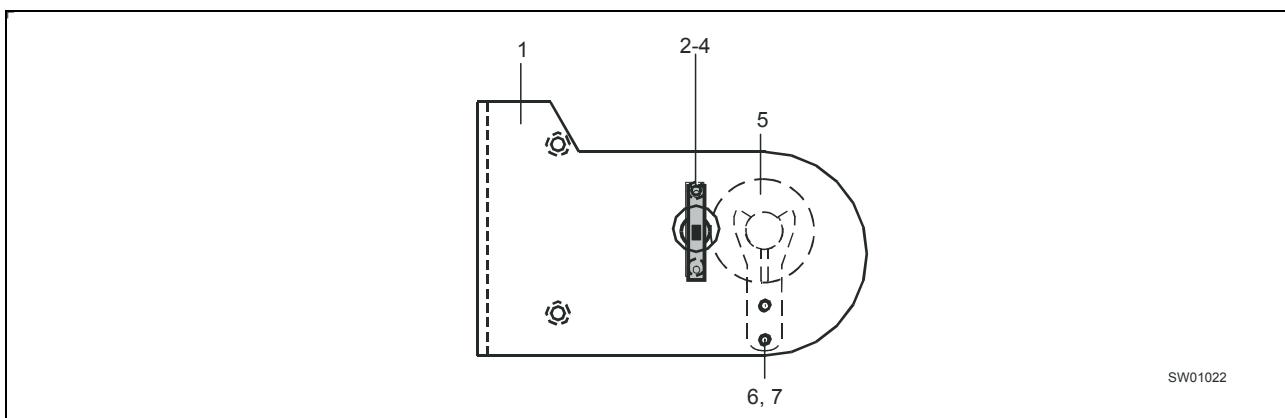
| Pos. | Code | Part No. | | Designation | Qty. | Remarks |
|------|------|-----------|-----------|------------------------------|------|---------|
| | | 80 mm | 112 mm | | | |
| 1 | SP | 00767-080 | 00767-112 | – Roll holder frame | 1 | |
| 2 | | 00735-000 | | – Adjustment arm | 1 | |
| 3 | SP | 10618-001 | | – Opto sensor assy | 1 | |
| 4 | | 101-166 | | – Screw MFX-H M2x8 | 4 | |
| 5 | | 09022-307 | | – Nut M6M M2 | 8 | |
| 6 | | 09100-220 | | – Screw MRX-H M3x6 | 2 | |
| 7 | SP | 02250-002 | | – Snap lock | 2 | |
| 8 | | 09101-222 | | – Screw MFX-H M3x8 | 4 | |
| 9 | SP | 00768-080 | 00768-112 | – Paper roll spindle Ø 39 mm | 1 | |
| 9 | SP | 01345-080 | 01345-112 | – Paper roll spindle Ø 25 mm | 1 | |
| 10 | | 02379-000 | | – Hub | 1 | |
| 11 | | 09101-220 | | – Screw MFX-H M3x6 | 1 | |
| 12 | | 00358-000 | | – Cable clamp | 2 | |

GENERATION 2



| Pos. | Code | Part No. | | | Qty. | Remarks |
|------|------|-----------|-----------|--------------------------------------|------|---------|
| | | 80 mm | 112 mm | Designation | | |
| 0 | SP | 01602-080 | 01602-112 | Roll holder assy, 200 mm (8") behind | | |
| 1 | SP | 100823 | 100982 | – Roll holder frame | 1 | |
| 2 | | 100357 | | – Spacer DRM 2240x3 | 4 | |
| 3 | | 09022-307 | | – Nut M6M M2 | 2 | |
| 4 | SP | 10618-001 | | – Opto sensor assy | 1 | |
| 5 | | 01404-000 | | – Sensor cover | 2 | |
| 6 | | 100877 | | – Hexagonal spacer M2x6 NV=5 | 4 | |
| 7 | | 100881 | | – Screw MFX-H 2x14 | 2 | |
| 8 | | 100853 | 101035 | – RS232 adapter/switch assy | 1 | |
| 9 | | 09101-220 | | – Screw MFX-H M3x6 | 1 | |
| 10 | | 09100-218 | | – Screw MRX-H M3x4 | 1 | |
| 11 | | 00515-000 | | – Hub | 1 | |
| 12 | | 100878 | | – Adjustment arm assy | 1 | |
| 13 | | 09100-220 | | – Screw MRX-H M3x6 | 2 | |
| 14 | | 00358-000 | | – Cable clamp | 2 | |
| 15 | SP | 00768-080 | 00768-112 | – Paper roll shaft ø39mm | 1 | |
| 15 | SP | 101069 | 101070 | – Paper roll spindle Ø25 | (1) | Option |

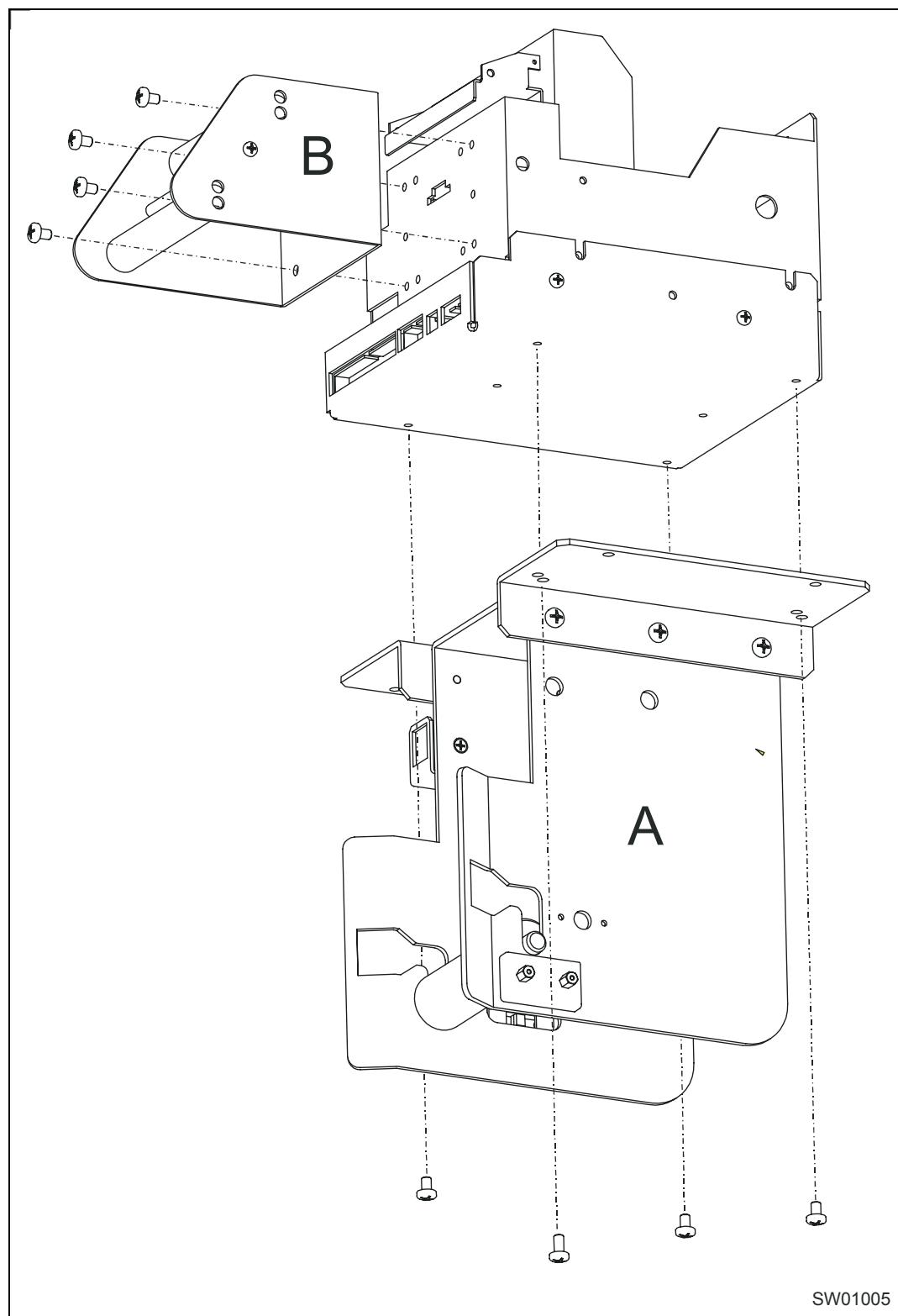
4.3.4 Drop in roll holder assy, 150 mm (6") behind



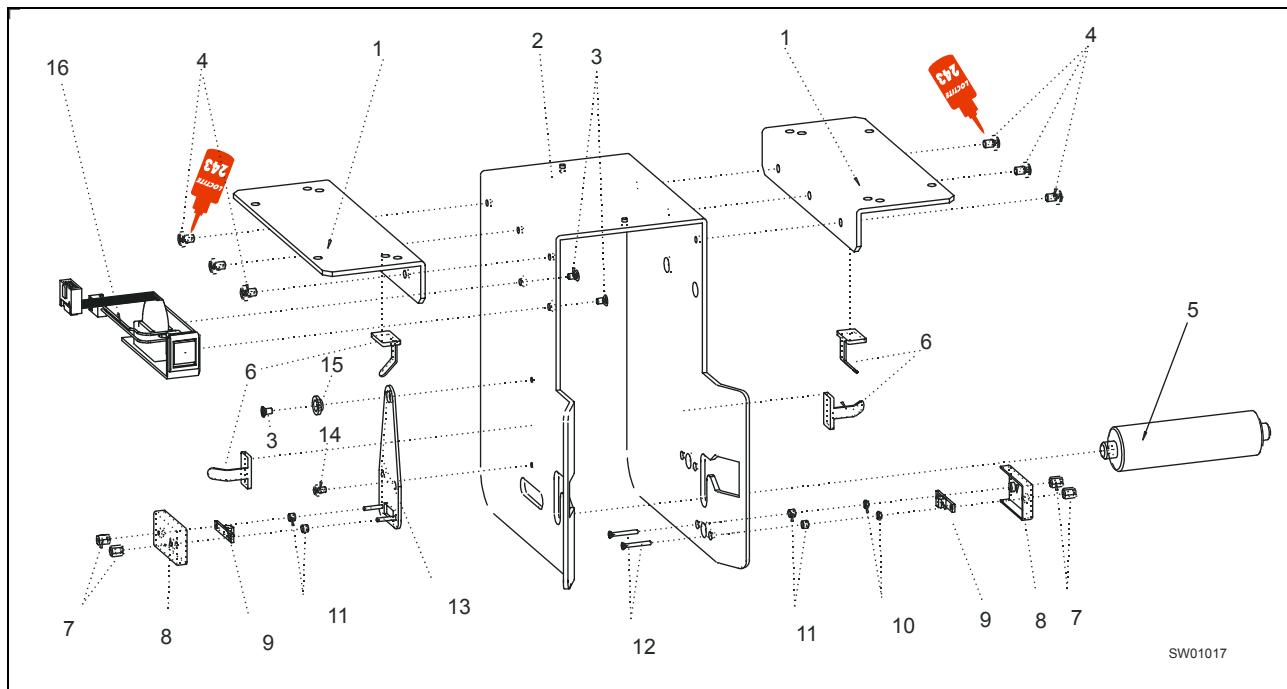
| Pos. | Code | Part No. 112 mm | Designation | Qty. | Remarks |
|------|------|--------------------|------------------------------------|------|---------|
| 0 | | 101379 | Drop-in rollholder 150mm | | |
| 1 | | 01344-112 | - Rollholder frame | 1 | |
| 2 | SP | 10618-001 | - Opto sensor assy | 1 | |
| 3 | | 09101-168 | - Screw MFX-H M2x10 | 2 | |
| 4 | | 09022-307 | - Nut M6M M2 | 2 | |
| 5 | SP | 01345-112 | - Paper roll spindle, ø25mm | 1 | |
| 6 | SP | 02250-002 | - Snap lock | 2 | |
| 7 | | 09101-222 | - Screw MFX-H M3x8 | 4 | |
| 8 | | 01067-000 | - Connector bracket, right | 1 | |
| 9 | | 00601-000 | - Adapter Cable, Parallel, L 230mm | 1 | |
| 10 | | 10730-000 | - Feed button assy | 1 | |

4.3.5

Roll holder Option 250mm (10")

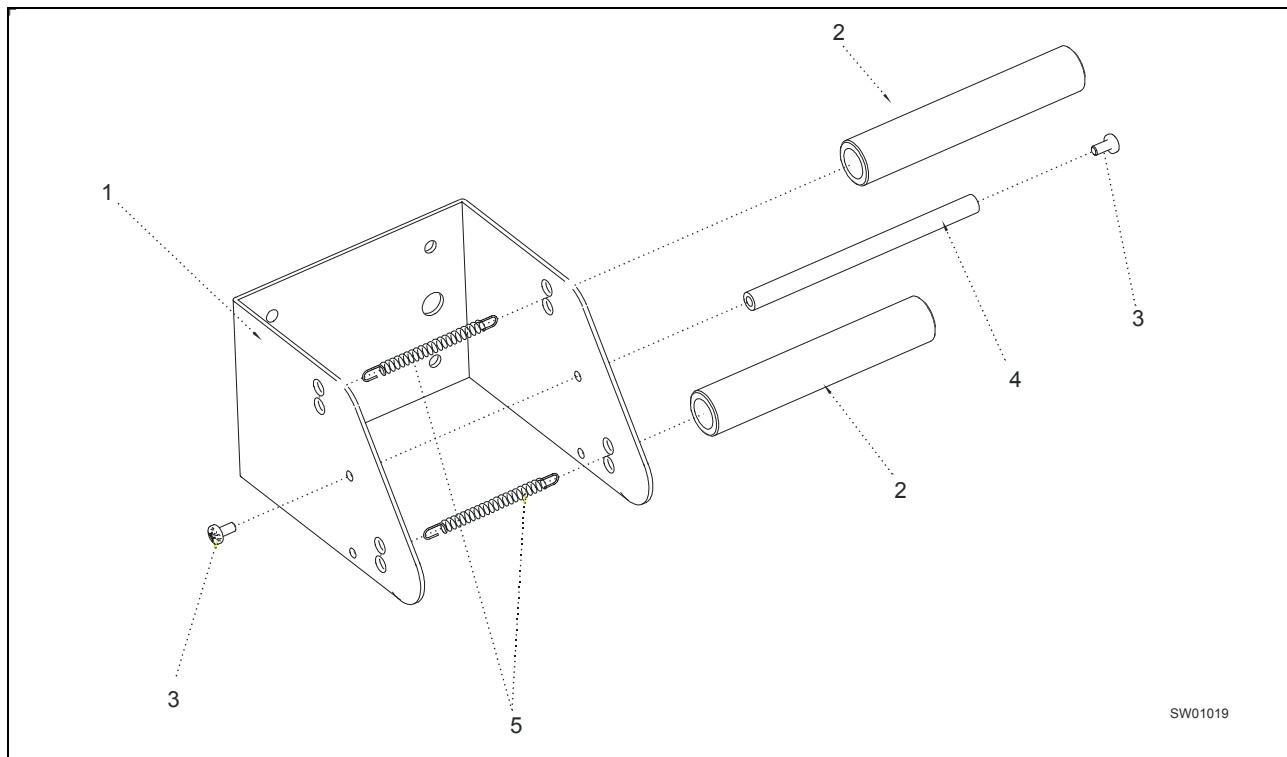


ROLL HOLDER ASSY. 250 mm (10")



| Pos. | | Part No. | | | | Qty. | Remarks |
|------|------|-----------|-----------|-------------------------------|-----|--------|---------|
| | Code | 80 mm | 112 mm | Designation | | | |
| A | SP | 101042 | 101047 | Roll holder assy. 250mm (10") | | 1 | |
| 1 | | 101044 | 101049 | – Bracket | | 2 | |
| 2 | SP | 101043 | 101048 | – Roll holder chassis | | 1 | |
| 3 | | 09101-219 | | – Screw MFX-H M3x5 | | 3 | |
| 4 | | 09100-284 | | – Screw, MRX-H 4x5 fzb | | 6 | |
| 5 | SP | 101069 | 101070 | – Paper roll spindle Ø25 | | 1 | |
| 5 | SP | 00768-080 | 00768-112 | – Paper roll spindle Ø39 | (1) | Option | |
| 6 | SP | 00358-000 | | – Cable clamp | | 4 | |
| 7 | | 100877 | | – Hexagonal spacer M2x6 NV=5 | | 4 | |
| 8 | | 01404-000 | | – Sensor cover | | 2 | |
| 9 | SP | 10618-003 | | – Opto sensor assy | | 2 | |
| 10 | | 09022-307 | | – Nut M6M M2 | | 2 | |
| 11 | | 01669-000 | | – Tube spacer DRM 2240x3 | | 4 | |
| 12 | | 100893 | | – Screw MFX-H M2x16 | | 2 | |
| 13 | SP | 100878 | | – Adjustment arm assy | | 1 | |
| 14 | | 09100-218 | | – Screw MRX-H M3x4 | | 1 | |
| 15 | | 00515-000 | | – Hub | | 1 | |
| 16 | SP | 101148 | | – RS232 Adapter/switch assy. | | 1 | |

PAPER STRAIN RELIEF ASSY.



| Pos. | Code | Part No. | | | Qty. | Remarks |
|------|------|-----------|--------|-----------------------------|------|---------|
| | | 80 mm | 112 mm | Designation | | |
| B | SP | 101073 | 101074 | Paper strain relief assy. | | |
| 1 | | 101065 | 101052 | – Strain relief frame | 1 | |
| 2 | SP | 101064 | 101053 | – Roller | 2 | |
| 3 | | 09100-220 | | - Screw MRX-H M3x6 | 2 | |
| 4 | | 101071 | 101072 | – Shaft | 1 | |
| 5 | SP | 101066 | 101054 | – Tension spring, stainless | 2 | |

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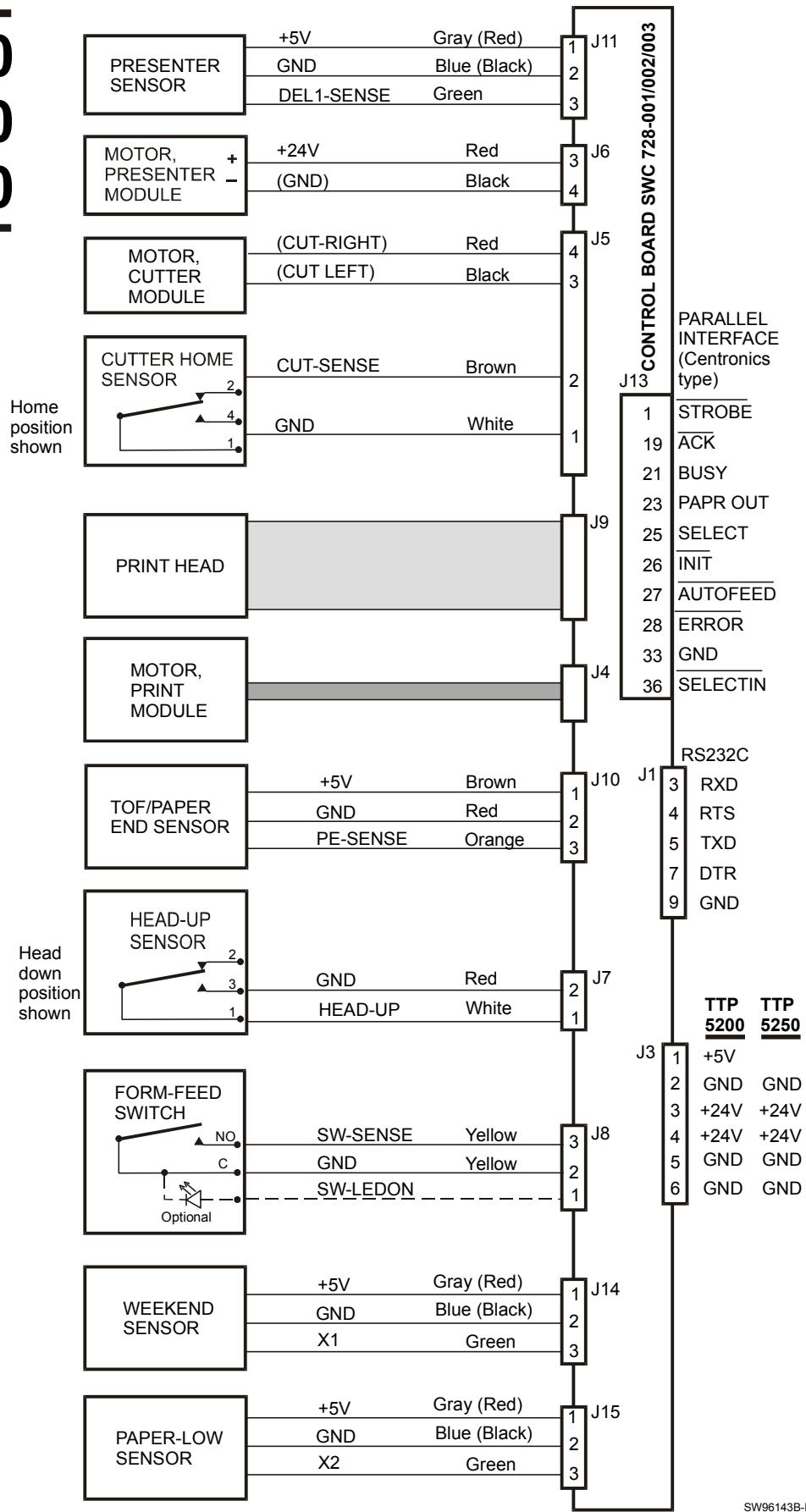
DRAWINGS

| | |
|--|---------|
| Printer interconnections | Page 40 |
| Control board 00728-XXX (SWC728) connectors and indicators | 41 |
| Component layout | 42 |
| 00728-002, logic diagram, sheet 1 | 43 |
| 00728-002, logic diagram, sheet 2 | 45 |
| 00728-002, logic diagram, sheet 3 | 47 |
| Versions | 48 |
| Revisions | 49 |

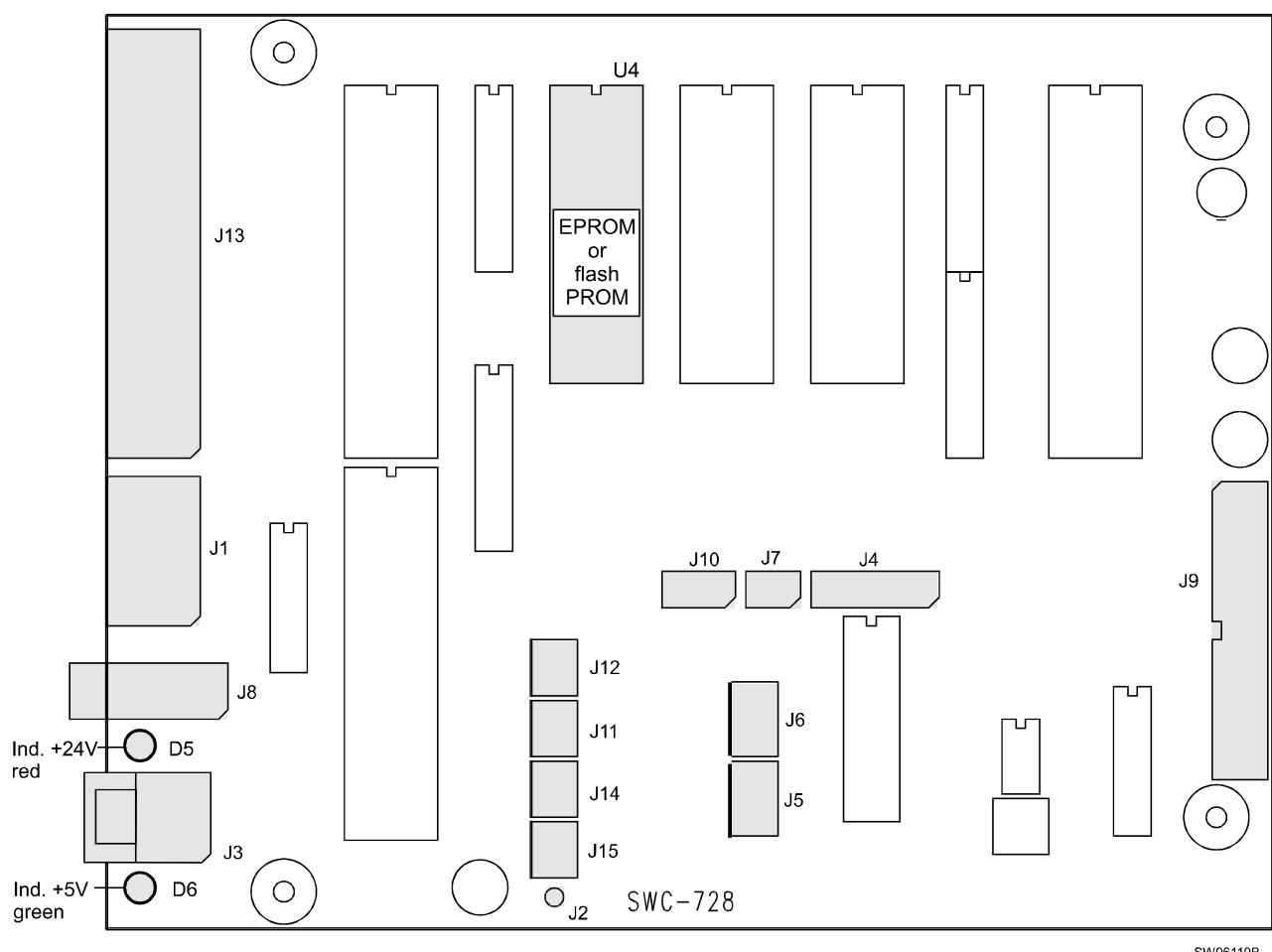
TTP 5100

TTP 5200

TTP 5250



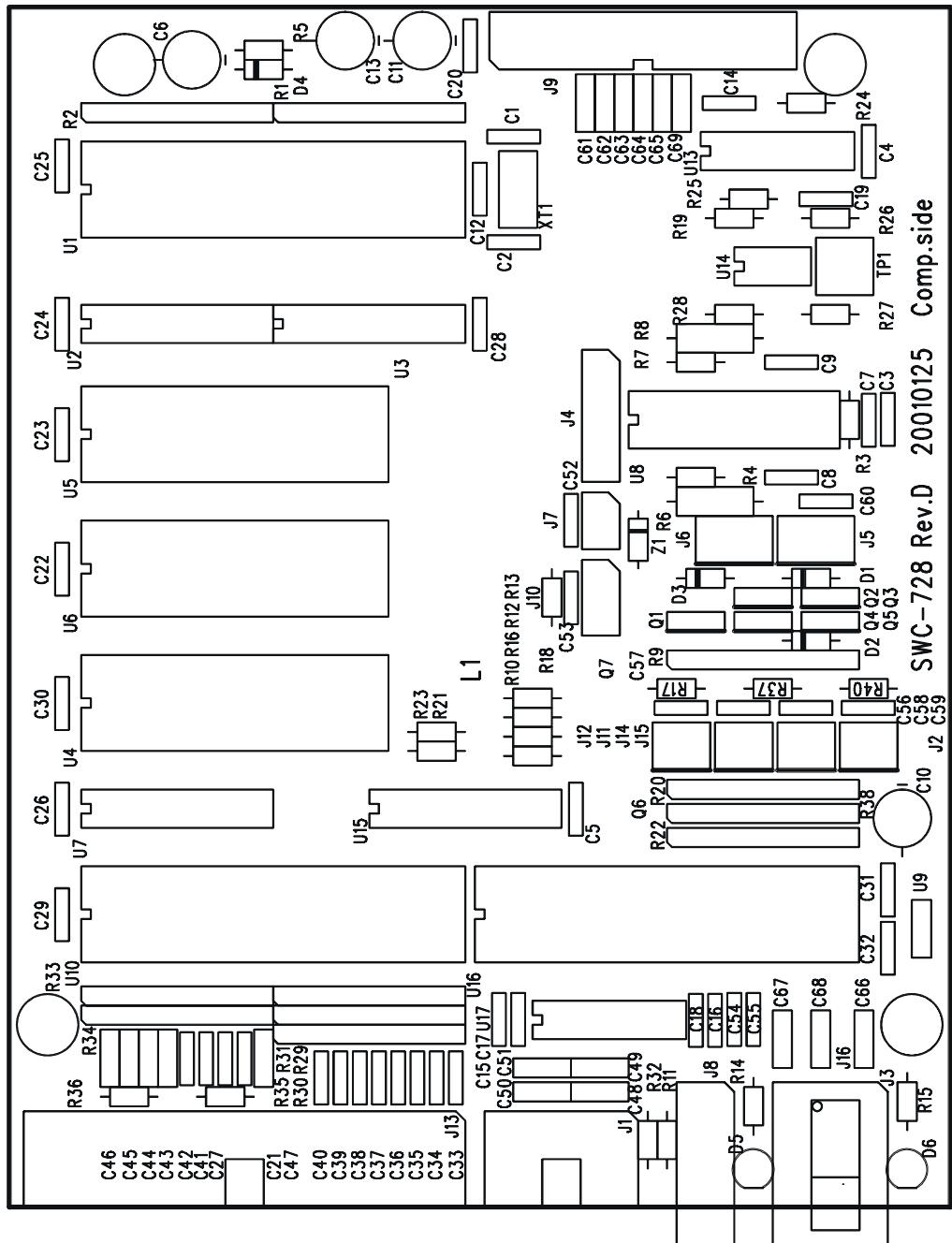
Connectors, indicators, etc. on the control board.

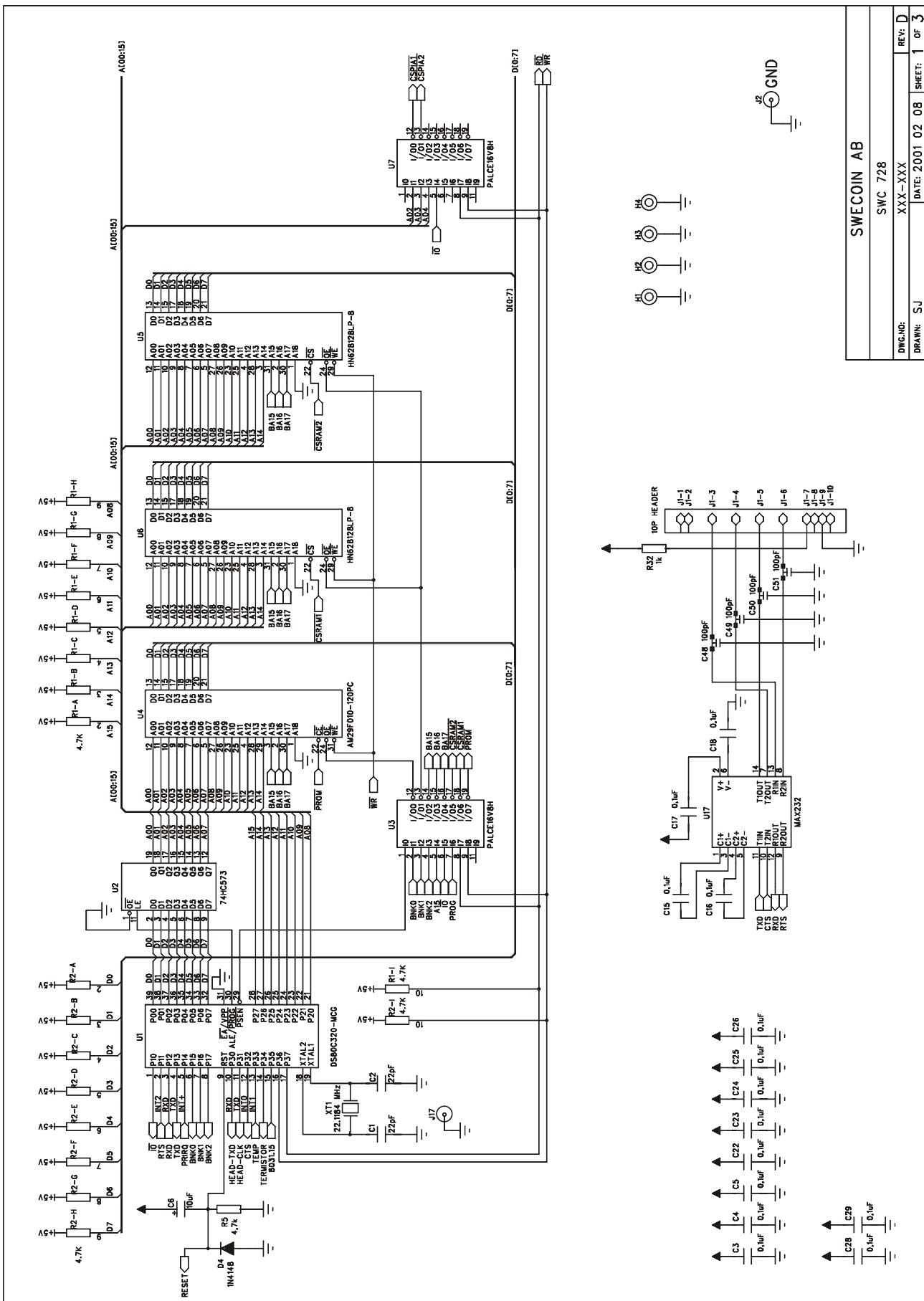


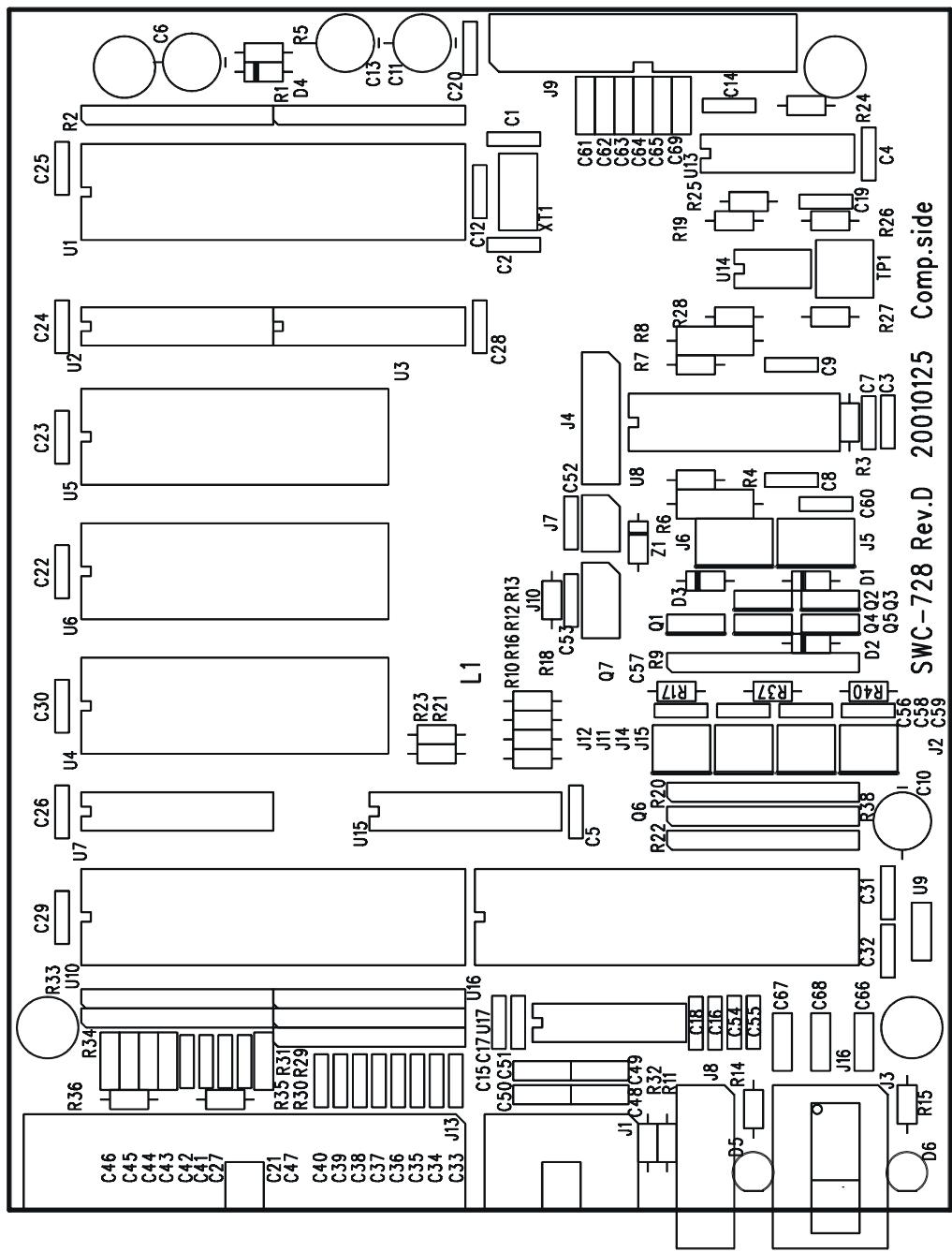
SW96110B

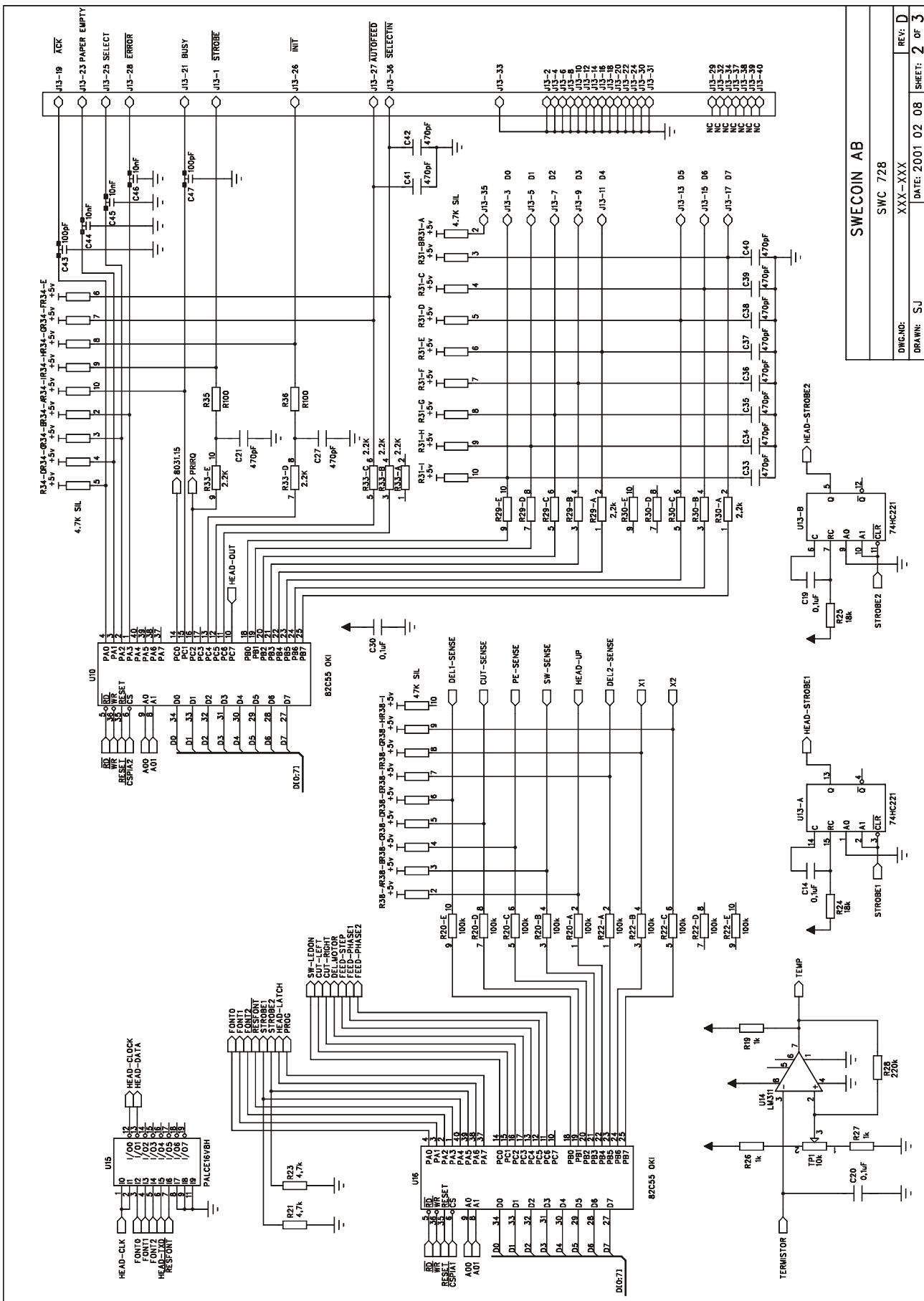
| | | | |
|----|--|-----|------------------------|
| J1 | RS232C interface | J9 | Print head |
| J2 | Signal ground (test point) | J10 | TOF / paper end sensor |
| J3 | Power, +5 VDC, +24 VDC or +24 VDC only | J11 | Presenter sensor |
| J4 | Motor, print module | J12 | Not used |
| J5 | Motor, cutter module cutter-home sensor | J13 | Parallel interface |
| J6 | Motor, presenter module | J14 | Weekend sensor |
| J7 | Head-up sensor | J15 | Paper-low sensor |
| J8 | Form-feed switch | U4 | Flash PROM |

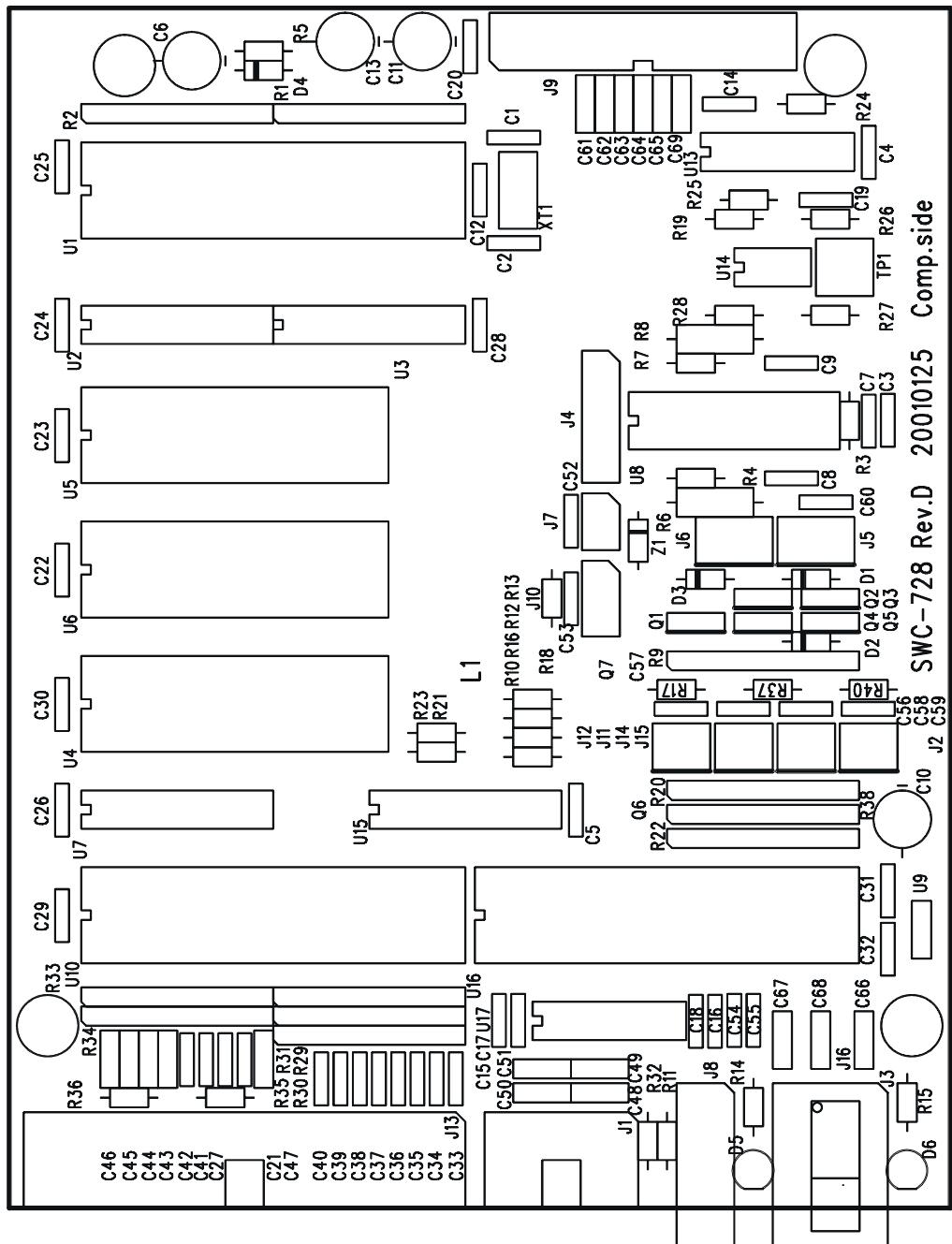
U9 is not fitted on 00728-001. J16 (2-pole power connector) is not fitted.

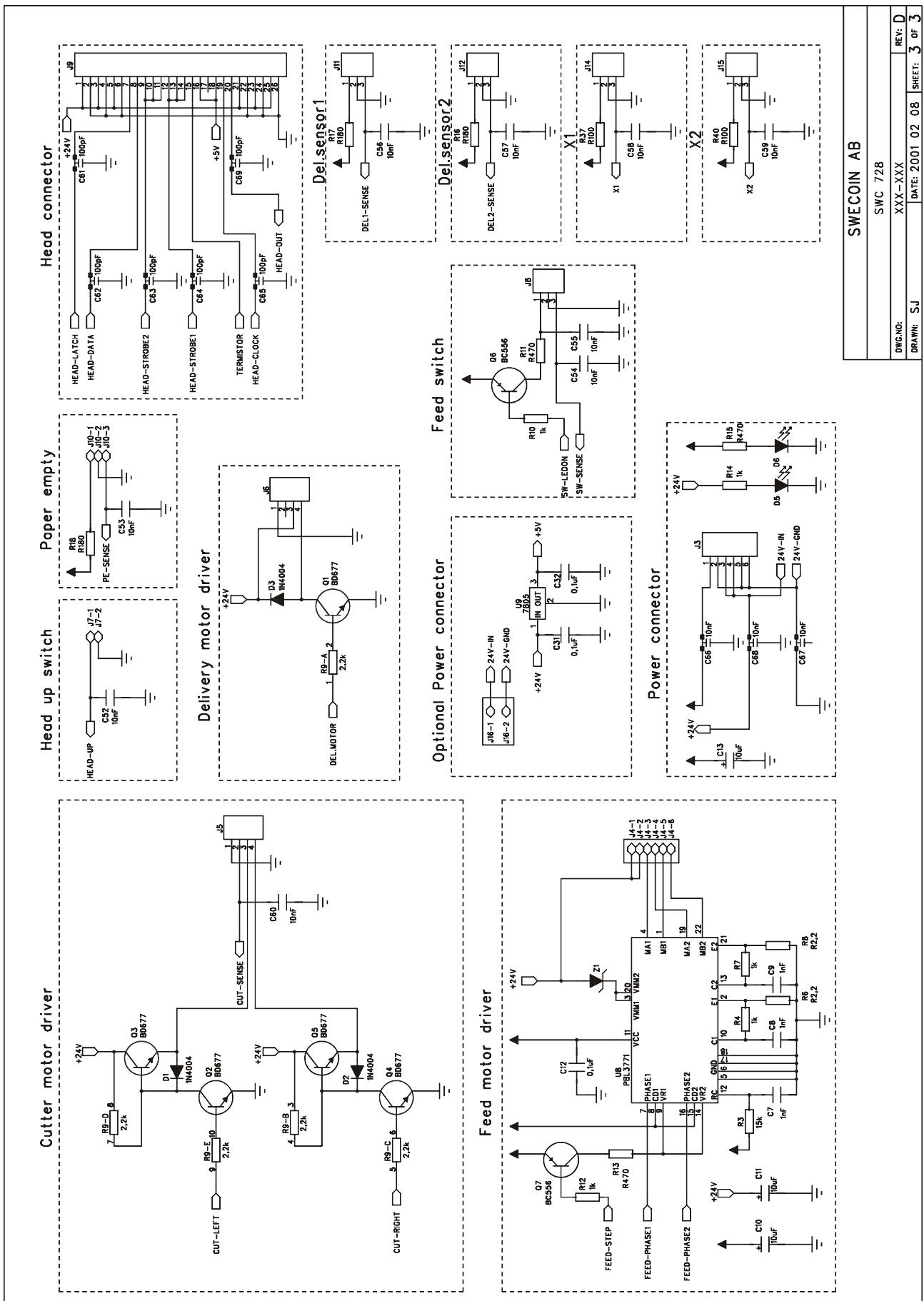












5.1

Versions

The logic diagrams and component placement shown in this manual is for the 00728-002 version of the board. Below you find an overview of the differences between these and the other versions available.

00728-001

Corresponds to the 00728-002 logic diagram with the following exception:

- RAM capsule U5 (sheet 1, drawing pos. 2D) is *not* installed.

00728-002

This is the board that is on all the logic diagrams in this manual.

00728-003

Corresponds to the 00728-002 logic diagram with the following exceptions:

- 5 Vdc voltage regulator U9 (sheet 3, drawing pos. 3B) is installed
- Capacitor C66 (sheet 3, drawing pos. 3A) is not installed.

00728-004

Not used in TTP 52x0 printers

00728-005

Corresponds to the 00728-003 logic diagram with the following exceptions:

Parallel and serial connector equipped with strain relieves

00728-006

Corresponds to the 00728-002 logic diagram with the following exceptions:

Parallel and serial connector equipped with strain relieves

5.2

Revisions

There are two revisions on a 728 board:

1. The Printed Circuit Board (PCB) revision is etched into the board.
2. The Printed Circuit Assembly (PCA) revision that is printed on the label attached to the assembled PCB, and indicates what components are fitted.

5.2.1

PCA Revision E

REASON FOR CHANGE

In order to make the TTP5xx0 series compatible with the ISO-1284 Compatibility-mode timing, some components on the PCB has been changed. This allows EPP or ECP mode to be selected on the parallel port of the PC.

Some computers also had problems communicating with the printer at higher baud rates. This has also been found to be related to component values on the PCB.

EMC testing has been performed to verify that the modifications comply with the EMC rules.

CHANGE DESCRIPTION

The following components have been changed:

| Name | Old value | New value |
|--------|-----------|-----------|
| C21 | 1nF | 470pF |
| C27 | 1nF | 470pF |
| C41-42 | 1nF | 470pF |
| C43 | 10nF | 100pF |
| C47-51 | 10nF | 100pF |

BACKWARD COMPATIBILITY

The new boards are fully backward compatible.

5.2.2

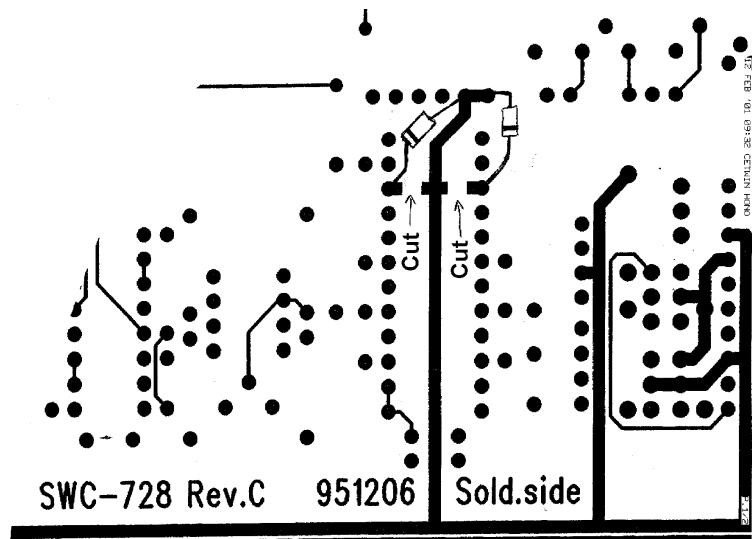
PCA Revision F

Compressed text has been experienced especially at high stepper motor temperatures. To increase the pull force of the printer stepper motor the reverse clamping voltage of the circuitry has been increased from 24 to 36V. This also reduces heat production in the motor. An EMI filter has been added to the printhead data output to further decrease radiated EMI.

CHANGE DESCRIPTION

The following components have been added:

Z1, and Z2 = BZX85/C12



5.2.3

PCA Revision G

REASON FOR CHANGE

When EMC testing rev. F, some additional modifications was made to increase the margins to EMC test limits.

CHANGE DESCRIPTION

The following components have been changed:

| Name | Old value | New value |
|------|-----------|-----------|
| C29 | 100kΩ | 2.2k |
| C30 | 100kΩ | 2.2k |

5.2.4

Printed Circuit Board (PCB) Revision D

REASON FOR CHANGE

The manual changes of PCA Rev. F has now been incorporated in the PCB layout.

Printhead data out is now fed back to microprocessor for automatic printhead width determination.

CHANGE DESCRIPTION

The following components have been changed 2001-01-30:

Z1=BZX85/C12 added (stepper motor).

C69=100pF, added EMI-filter on printhead data input.

Mounting holes modified (No longer plated).

BACKWARD COMPATIBILITY

The new boards are fully backward compatible.